PLANNING THE MEDICAL WORKFORCE

MEDICAL WORKFORCE STANDING ADVISORY COMMITTEE: SECOND REPORT

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The Medical Manpower Standing Advisory Committee was renamed on 1 February 1995. "Workforce" is the term being used most frequently in the field of medical staffing and it is the terminology which best expresses equality of opportunity. The Committee shall in future be known as the Medical Workforce Standing Advisory Committee (MWSAC).

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Your reference

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The Rt Hon Virginia Bottomley MP JP
Secretary of State for Health
Richmond House
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VICE-CHANCELLOR
—
Professor Sir
Colin Campbell

Dear Secretary of State.

Medical Workforce Standing Advisory Committee
Second Report

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On behalf of the Committee, I am pleased to submit to you our Second Report.

As a Standing Committee, we have, over the past two years, been able to examine a wide range of issues. We have consulted both formally and informally with many of those people and organisations directly and indirectly responsible for the delivery of health care in the United Kingdom. This Report comments on the most pressing issues relevant to the supply of, and demand for, doctors.

Most significantly, we wish to draw your attention to our conclusion that we need to train more doctors for the NHS. The timescales associated with medical education make this an issue for your urgent attention.

I would also like to thank the members of the Committee, all of whom have contributed their knowledge, expertise and time towards the production of this report. My particular thanks are due to those members who formed a sub-group to track the progress of the 'Affordability Study'. I know I speak for all members of the Committee in recording our thanks to our very able Secretariat. Mrs Bellord and all her colleagues supported us in our work most ably and helpfully.

I hope that you find this report helpful and I look forward to receiving your response to our recommendations.

Yours sincerely
Colin Campbell

EXECUTIVE SUMMARY

This is the second report of the Medical Workforce Standing Advisory Committee (formerly the Medical Manpower Standing Advisory Committee) on the long term demand for doctors in the United Kingdom.

Overview

The report examines flows of doctors into and out of the UK and the balance between home and EC trained doctors and doctors who qualified overseas. It looks at indicators of a potential shortfall of doctors and reaffirms the need for the UK to maintain an appropriate balance between home and overseas doctors. **(Chapter 4)**

MWSAC has re-examined historic trends and made forecasts of the demand for doctors needed up to the year 2020. MWSAC concludes that there should be an increase in the number of UK trained doctors. It concludes that future growth should fall within the range implied by the two scenarios below:

the projection used in MWSAC's 1992 report which implied a growth in whole time equivalent doctor numbers of 1.0% per annum; and

a continued growth projection which extrapolates the historic trend of 1.7% per annum growth in whole time equivalent doctor numbers. **(Chapters 5 and 6)**

It also considered a range of projections of the supply of doctors, taking account of projections for such factors as: differential leaving rates, decreasing numbers of overseas qualified doctors, faster increases in numbers of EC doctors, and increasing medical school intake.

The Committee recommends a policy of increasing the intake of medical students annually by a moderate amount rather than in one off large increases. The cost implication of a suggested increase in student intake is noted as is the capacity of medical schools and the NHS to train additional doctors. **(Chapter 7)**

The report also focuses on some key issues that influence the medical workforce, in particular it comments on:

- advances in medical technology and the impact of these on the demand for doctors; there are no indications at present that fewer medical personnel will be required to provide healthcare as the diversity and extent of technology increases **(Chapter 8)**

- managing local change in the NHS eg. by changing the skill mix to meet and match the changes in patterns of health care **(Chapter 9)**

- the evolving management and medical audit skills of a new generation of doctors working in an NHS that will increasingly focus on effective service delivery **(Chapter 10)**

- maximising the potential of UK trained doctors by securing improvements to medical education and training and by reducing the number who leave the NHS prematurely **(Chapter 11)**

In its first report "Planning the Medical Workforce", MWSAC recommended research on the affordability of medical staffing increases. This report summarises the pioneering work by consultants to produce scenarios of health care and medical workforce usage over the next twenty years. The Committee has invited views from a wider audience on this innovative approach. **(Chapter 12)**

Recommendations

To allow the Department for Education and other bodies to plan in advance for the expansion of existing medical schools, the Committee recommends:

- a gradual increase in medical students for five years from 1996 to arrive at a maximum annual target intake of 4,970 by the year 2000.

- that higher education bodies have regard to the desirability of achieving cost effective expansion in planning for the increased target.

MWSAC noted increasing demand for places in UK medical schools from overseas students but was equally aware that excess capacity in medical schools is limited. It has therefore not recommended a change to the current overseas student quota of 7.5% of total intake. The proposed increase in total student intake implies a small increase in overseas student numbers.

In order to make optimal use of the skills of all health care professionals the Committee recommends:

- that skill mix changes are encouraged where they may benefit staff and patients

- that new initiatives should be carefully evaluated particularly with respect to patient outcomes and efficiency gains.

- that a central database on the development and evaluation of new roles, innovations and practices be established

- that information from this be made available for the guidance of purchasers

Looking ahead, the Committee awaits the findings of studies it has recommended on the career patterns of doctors and evaluation of skill mix initiatives to meet the changes in patterns of health care. MWSAC views relevant research and good data as fundamental to informing its future considerations and recommends:

- that further research is commissioned on the effects of substitution, medical staff productivity, the differential development of service provision between sectors and between specialties.

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APPENDICES

1 INTRODUCTION

TERMS OF REFERENCE

1.1 This is the second report of the Medical Manpower Standing Advisory Committee (MMSAC) henceforth to be known as the Medical Workforce Standing Advisory Committee (MWSAC) to the Secretary of State for Health. Our terms of reference remain:

To advise the Secretary of State for Health on future developments in the balance of medical manpower supply and demand in the United Kingdom, taking account of resource assumptions and other guidance which the Secretary of State, in consultation with other Health Ministers, may give to the Standing Advisory Committee; and

To make recommendations about the medical school intake, including the balance between home and overseas students and the timing of any changes, taking into account the resources available within the University Funding Council's aggregate funding and from overseas students' fees, as well as the facilities for clinical students.

MEMBERSHIP

1.2 The Committee was appointed in 1991 by the Secretary of State for Health as an independent committee rather than as a representative one. Members contribute a range of expertise in medical, statistical, social and economic fields. Since making our first report[1] in December 1992, an additional member with senior management experience in the NHS has been appointed. A full list of the membership is at Appendix 1.

1.3 Our considerations on the current and future demand for, and supply of, doctors cover the whole of the United Kingdom. We are assisted in noting national perspectives by Observers from the Scottish Home and Health Department, the Welsh Office and the Department of Health and Social Services in Northern Ireland.

1.4 Our Secretariat is provided by the Medical Education, Training and Staffing Division of the NHS Executive, with support from colleagues in the Department of Health and the Department for Education.

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1 Planning the Medical Workforce - First report of the Medical Manpower Standing Advisory Committee: Department of Health, December 1992

METHOD OF APPROACH

1.5 Our first report involved an extensive stocktake of the current medical staffing position and identified some key issues which are likely to have a major influence on the future medical workforce. Continuing this approach we have gathered further evidence from bodies and organisations which use, employ, influence or form part of the medical workforce. We have noted the rate and extent of change occuring in the NHS and in the wider provision of health care, which we expect our future agenda will reflect. Our position as a standing committee allows us to maintain a listening or watching brief on many general matters concerning the medical workforce, and also to focus on more particular issues, which from time to time we may consider require closer scrutiny.

1.6 In this report we return to the key issues identified in our first report which include:

- changes to the **skill mix** affecting the demand for doctors;
- advances in **medical technology** and the effect on the demand for doctors;
- the changing pattern of doctors' **workload**
- doctors working **outside the NHS**.

1.7 We invited written evidence from thirty organisations and received twenty-three responses. Seven groups were invited to supplement their evidence with an oral presentation to the Committee. In addition to this formal process we visited a number of sites in order to listen and see at first hand the everyday concerns of clinicians, nurses, managers and other health professionals. A list of the organisations which gave evidence or were visited by the Committee or Secretariat is at Appendix 2.

1.8 We are grateful to all those individuals and organisations who have helped us. We have taken account of their views, in writing this report. The conclusions and recommendations in the report are of course our own.

FORMAT OF THIS REPORT

Progress and change since December 1992

1.9 We deal first with the changes in the NHS since December 1992 and the impact of our first report.

1.9.1 "Planning the Medical Workforce" set the scene for a programme of future work. Three specific research projects were proposed and the recommendations were accepted in full by the Secretary of State for Health in April 1993. A list of the recommendations and progress reports on their implementation is at Chapter 2.

1.9.2 Proposals to change the management structure of the NHS[2] prompted the Committee to look at the advisory machinery for medical staffing in the UK and to recommend some changes. Our reasoning for these changes is explained in Chapter 3.

1.9.3 A major change to the structure of specialist medical training[3] is currently being implemented. We have referred to the "Calman" changes several times in the course of this report and we are aware that this is a factor which will have a significant impact on medical workforce planning.

Reviewing Supply and Demand

1.10 The second part of this report relates to our remit to advise on the medical school intake. This required a thorough revision of our demand and supply projections and the principles that underpin them.

1.10.1 Much of the evidence and opinion presented to us, states that there are not enough doctors in the UK to meet current and future needs. We have reviewed our statement on self-sufficiency and considered the impact of the European Union (EU)[4] and overseas doctors on the UK workforce in Chapter 4.

1.10.2 We have reviewed the longer term demand for doctors in Chapter 5. Our projections are intended to take account of the resources likely to be available to the NHS.

1.10.3 Chapter 6 revises our projection for the supply of doctors in the NHS, noting changes from our previous projection and improvements to the modelling process. In Chapter 7, we compare the demand and supply projections and consider the necessary medical school intake.

Key Issues

1.11 The four key issues highlighted previously for further consideration are addressed in the third part of this report, together with a discussion of our developmental work on assessing the demand for doctors. A great deal of change and uncertainty surrounds these topics, but we thought it useful to outline some of the potential effects on the medical workforce and to try and identify the most useful areas for future research.

1.11.1 Rapid and continuing change in medical technology has provoked a

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2 Managing the New NHS, NHS Executive, October 1993

3 Hospital Doctors: Training for the Future. The Report of the Working Group on Specialist Medical Training.(The Calman Report) Department of Health. April 1993

4 A definition of EU/EC is included at Appendix 13

flurry of new initiatives and advisory groups which expect to bring some order and rationale to the use of new technology by medical staff. In Chapter 8 we have distilled some of this diverse information and attempt to judge the impact of these advances on the future demand for doctors.

1.11.2 Changing the skill mix in the workforce appears to us to be an integral part of managing change in the health service. We explore several approaches and discuss the implications of such changes on medical staffing in Chapter 9.

1.11.3 Chapter 10 looks at the changing demands on doctors' time. We have heard evidence not only of the changing nature of their work, but of increasing workloads which may demand revision of the traditional roles of consultants and general practitioners (GPs).

1.11.4 Related to aspects of the above is the current low level of morale amongst medical staff in the NHS. In Chapter 11 we look at ways in which doctors may maximise their potential and explore mechanisms to minimise the premature loss of doctors from medicine and the NHS.

1.11.5 Following from the recommendation in our first report that the "affordability" of medical workforce increases should be investigated, research was commissioned by the NHS Executive. The resulting study devised an innovative approach to forecasting which is described in detail at Chapter 12. There is more work still to be done and we have not used the new approach in the supply and demand projections for this report. However we wanted to take this opportunity to introduce the methodology and invite comment.

1.11.6 The report concludes with a summary of recommendations in Chapter 13.

CONCLUSION

1.12 Our task is to plan for the overall number of doctors needed in the United Kingdom. We are asked sometimes why we do not make assessments of the demand for doctors in individual specialties, but a retrospective look at specialty development over the past twenty years demonstrates how unpredictable and rapid major developments can be. We prefer to make a more general projection, within which differential growth rates of individual specialties can be managed by the short-term advisory mechanisms which already exist.

1.13 Previous medical workforce planning committees asked to make long-term forecasts were dismantled after delivery of a single report. Noting the historical consequences of that approach and the scale and rate of change in the health service, our Committee intends to take an incremental approach to long term planning and to track the development of key issues over time. The task is not a simple one and

there is never likely to be a precise answer to the question - how many doctors will we need? Many factors are involved and their influence will vary with time. We think that the best approach is a measured and iterative examination of current and predicted trends, consultation with expert opinion and then monitoring and adjusting the numbers of medical students as appropriate.

2 PROGRESS ON THE RECOMMENDATIONS FROM OUR FIRST REPORT

INTRODUCTION

2.1 The recommendations we made in our first report covered several different aspects of the structure and training of the medical workforce. This chapter monitors progress on the implementation of each of these recommendations.

PROGRESS ON INDIVIDUAL RECOMMENDATIONS

Flexible Working and Training

2.2 "We *recommend* that the numbers of part-time posts in all training grades are increased. At the same time there should be a recognition that part-time training is of equal quality with that gained on a full time basis." (1992)

2.3 For many years centrally administered schemes to promote flexible training have had only limited success. The difficulties of obtaining manpower and educational approval and funding, together with the widely held notion that these posts provided second rate training for second rate candidates and took inordinately long to complete, meant that uptake of flexible training was low and the status of trainees even lower. Much has changed in the last five years, although some of the logistical difficulties remain. As graduates from the flexible training schemes move out into the career grades with considerable success, the demand for, and status of, flexible training posts is steadily increasing.

2.4 Progress in changing attitudes to flexible working has accelerated largely because of the growing realisation that the intake to medical schools is now over 50% female and that many of these graduates may not wish to work full-time for periods of their postgraduate training or early career grade years. Interestingly there is now a substantial attitudinal change amongst male doctors, many of whom now also wish to work part-time for periods during their career.

2.5 Some of the recent developments in this area do not flow directly from our first report but happily coincide with the implementation of our recommendation. The work of the Joint Working Party on Flexible Training[1], Postgraduate Deans and Associate Deans, the Medical Royal Colleges and the Medical Women's Federation has been instrumental in bringing about changes in England. A scheme to promote flexible working for doctors in the training grades in Scotland was introduced in April 1993, following the report of the sub-committee of the Advisory Committee on Medical Establishments on part time training and working for doctors in Scotland.

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1 Flexible Training, Report of the Joint Working Party. NHS Management Executive April 1993

2.6 The Joint Working Party on Flexible Training reviewed the operation of flexible training at each grade and identified action required by the Department, Royal Colleges, Regions and Special Health Authorities. This was to improve the arrangements for part-time training in all regions and special health authorities, with the aim of increasing the proportion of all trainees working flexibly to above 5% of the national target of full-time trainees, by 2000. The uptake of flexible posts is specialty dependent, remaining low in male dominated specialties such as surgery, but the overall demand for less than full-time work at all grades is growing.

Senior Registrars

2.7 New arrangements for recruitment to the scheme in England and Wales (now known as *Senior Registrars: Flexible Training*) were introduced from August 1993. The appointments procedure for part-time senior registrars (SRs) has now been integrated with the local arrangements for full-time SRs. This move is intended to simplify the process of securing flexible training and may help equate the status of appointees to that of full-time trainees. Minor alterations have been made to the scheme in 1994, with national advertisements appearing in August, September and October and the closing date now left at the discretion of the Postgraduate Deans, allowing more time for applications and assessments. Following the 1994 round of appointments there were 442 part-time SRs in post in October 1994, out of a total allocation of 574 manpower approvals.

Career Registrars

2.8 The flexible career registrar scheme in England and Wales is now in its third year and attracting increasing interest. In October 1994, 364 part-time career registrar (CR) posts were funded or planned, representing 5.5% of registrars. The scheme has been centrally funded since 1991, but from March 1995 the budget will be distributed to regions, broadly based on the uptake of posts as at August 1994.

Senior House Officers and Pre-registration House Officers

2.9 There are no centrally managed flexible training arrangements in place for senior house officers (SHOs) or pre-registration house officers (PRHOs), although Health Authorities and NHS Trusts are free to establish personal flexible SHO and PRHO posts without specific central manpower approval.

Part-time Training for Doctors in Scotland

2.10 In Scotland, funding has been provided for 35 part-time posts at senior registrar and career registrar grade in 1993-94 and a further 35 in 1994-95. In practice about 25 of the first 35 posts were at senior registrar level. Candidates are interviewed by an integrated appointments committee.

2.11 "We *recommend* that the Department and the NHS give active support to the extension and implementation of initiatives on flexible working; with a

view to increasing the overall number of part-time opportunities for doctors at all career levels." (1992)

2.12 A part-time consultants scheme in England in April 1993, repeated in April 1994, has resulted in the establishment of 64 new posts of up to 6 sessions each in 1993/4 and approval of a further 85 posts for 1994/5. The posts were open to men or women who for well-founded individual reasons preferred to work part-time and the response was most encouraging with over 500 bids for each round. The new posts will help to promote part-time working as a sensible, businesslike option for Trusts and it is hoped that the success of this scheme will encourage employers to look increasingly at flexible working patterns, as a means both of delivering high quality health care to patients, and of minimising the loss of highly trained doctors from the medical workforce.

2.13 There have been no formal initiatives to increase flexible working opportunities for doctors in other career grades. The 1993 statistics[2] (England and Wales) showed that such initiatives may not be necessary:

- part-time working is well established in general practice and continues to increase. At present 9.8% of unrestricted principals in general practice (England and Wales) and 26.9% of female GPs work part time (Table 2.1).

- 34% of associate specialists hold part-time contracts; and

- 25.8% of female doctors in the staff grade work less than full time.

Medical Workforce Research

2.14 "We *recommend* that research is undertaken which will quantify the medical manpower effects of skill-mix initiatives." (1992)

2.15 Progress in this area has been hampered by the ad hoc nature of initiatives to date, which have often evolved in response to local staffing pressures. Although a quantitative research project would be difficult at this stage, the Department of Health has made a commitment to examine changes to the skill mix in its research and development programme, and work to commission a programme of suitable studies is ongoing.

2.16 Changes to the skill mix are more advanced and established in primary care, where for example, in the past ten years there has been more than a six fold increase in the number of practice nurses. Following our recommendation the Department has commissioned a study looking at skill mix changes at the interface between the GP and the primary health care team. The report is due in March 1996.

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2 Department of Health census, September 1990 & 1993

Table 2.1 Number of Part time Medical Staff in England and Wales By Grade, 1990 and 1993.

a) numbers of doctors working part time

	1990			1993		
	Male	Female	Both	Male	Female	Both
HCHS total	7,424	3,626	11,050	6,677	3,874	10,551
Consultant	1,031	492	1,522	1,151	596	1,747
Other non- training	6,246	2,642	8,890	5,432	2,680	8,112
Training grades	147	492	638	94	598	692
GMS[1]						
- Unrestricted principal	475	1,004	1,479	739	1,990	2,729
- Other GMS grades	-	-	-	155	291	446

b) percentage of doctors working part time

	1990			1993		
	Male	Female	Both	Male	Female	Both
HCHS total	19.7%	26.2%	21.4%	17.1%	24.8%	19.3%
Consultant	7.4%	19.4%	9.3%	7.9%	20.0%	9.9%
Other non- training	87.2%	90.9%	88.3%	77.4%	84.6%	79.7%
Training grades	0.9%	5.9%	2.5%	0.5%	6.3%	2.6%
GMS[1]						
- Unrestricted principal	2.3%	15.7%	5.4%	3.6%	26.9%	9.7%
- other GMS grades	-	-	-	14.5%	23.3%	19.2%

(1) Figures for the number of part time staff in the GMS sector are not available for 1990, except for unrestricted principals.

2.17 A report recently published on skill mix at the interface between junior doctors and nurses[3] has provided examples of good practice for dissemination. Another recent report considering dentistry,[4] also advocates a team approach to providing patient care.

2.18 "We *recommend* that research be undertaken to examine the career patterns of doctors, their reasons for leaving medicine and their future career intentions." (1992)

2.19 The Department of Health has recommissioned the Cohort Studies of Doctors' Careers[5], (based on the work of Professor James Parkhouse) from the Unit of Health Care Epidemiology, University of Oxford. The project will run for a three year period initially and has started by examining a new cohort of doctors qualifying in 1993, and revisiting the 1983 cohort. We expect the first results from this work in the summer of 1995.

2.20 "We await with interest the outcome of the debate on the length and intensity of postgraduate training. We *support* intentions to shorten the training period, and will return to this issue in a later report." (1992)

2.21 The Calman Report is being taken forward by a number of working groups and implementation is still in the planning stages. The introduction of the new unified training grade (to be known as specialist registrar), the adoption of a personal, regional and specialty specific national training number, the award of a Certificate of Completion of Specialist Training (CCST) and the provision of regular and validated derived data, should simplify the estimation of the numbers of trained doctors. The new system should also allow flexibility for individual doctors, in particular for those wishing to hold academic and research appointments or to train part-time. It is expected that the progress of all trainees on the newly published training programmes of the medical Royal Colleges, will be assessed and monitored throughout.

2.22 "We therefore *recommend* that the Department of Health make a study of the affordability of medical manpower increases to inform our future work." (1992)

2.23 The Department commissioned Pannell Kerr Forster Associates, in consortium with London Economics and Universal Health Consultants, to project the future costs of medical staffing across a range of scenarios. The project team reported to MMSAC in May 1994 and the study is discussed in detail at Chapter 12.

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3 The Interface between Junior Doctors and Nurses: A Research Study For the Department of Health. Greenhalgh and Company June 1994

4 Education and Training of Personnel Auxiliary to Dentistry : The Nuffield Foundation 1993.

5 Previously known as the Parkhouse studies - Doctors Careers: aims and experiences of medical graduates, Parkhouse J, Routledge. 1991.

Medical School Intake

2.24 "We therefore *recommend* an increase to the medical school intake of 240 students as soon as practicable. This would result in a revised target figure for UK medical school intake of 4470." (1992)

2.25 The Higher Education Funding Councils (HEFCs) issued new intake quotas for 1994-95.

2.26 "We further *recommend* that the Higher Education Funding Councils co-ordinate changes in student numbers resulting from our recommendations and those of the Tomlinson report." (1992)

2.27 The HEFC(England) has invited merger proposals from London medical schools in line with Government policy, and has agreed that decisions on student numbers in London should be deferred until progress had been made on these mergers.

2.28 "We *recommend* that part of any costs of expansion are met by funding growth at marginal costs as the Universities Funding Council (UFC) has indicated." (1992)

2.29 The Funding Councils were advised that no additional grant would be provided to fund intake increases. Based on the willingness in recent years of universities to admit students on a fees-only basis, the Funding Councils accepted that the revised intakes could be secured without an increase in grant for 1994/95.

2.30 NHS funding support for undergraduate medical education and research by means of Service Increment for Teaching and Research (SIFTR), will be monitored by the Steering Group for Undergraduate Medical Education and Research (SGUMDER).

2.31 "We therefore *recommend* that the number of medical school places reserved for overseas students is increased to around 340 representing approximately 7.5 percent of the total number of students." (1992)

2.32 HEFCs have informed each university that within its overall intake target the proportion of overseas students is expected to be 7.5%.

3 WORKFORCE PLANNING MECHANISMS IN THE UK AND THE IMPACT OF THE NEW NHS MANAGEMENT STRUCTURE IN ENGLAND

INTRODUCTION

3.1 We have looked previously at the career structure of hospital doctors and general practitioners, noting workforce issues relating to each. In this report we have reviewed the planning mechanisms which supported that career structure and shaped the present medical workforce in the United Kingdom (UK). During this review it became apparent that a change in these planning mechanisms was urgently required in England, to accommodate the recent major changes in NHS management and medical education and training.

PREVIOUS WORKFORCE PLANNING ARRANGEMENTS

Hospital Services

3.2 England - The existing medical and dental advisory machinery has developed in an incremental way for many years, leading to multiple committees with overlapping responsibilities. The Joint Planning Advisory Committee (JPAC) was set up in 1985 as the mechanism for matching numbers of specialist training posts to consultant opportunities. JPAC has been the chief means of implementing Achieving a Balance[1], a ten year plan published in 1987, which was intended to ensure *an adequate supply of properly trained hospital doctors in each specialty to provide a cost-effective, quality service to patients.*

3.3 This policy encourages consultant expansion of at least 2% per annum and also includes an early and partial retirement scheme for consultants and associate specialists. The Technical Sub-Group (of Achieving a Balance) had the responsibility for implementation of the policy. The numbers of SHOs were tightly constrained centrally up until late 1993 and responsibility has since been devolved to regional level. Staff grade numbers remain controlled to a national ceiling of 10% of consultant numbers.

3.4 JPAC reviewed all specialties at least every three years, in order to match the supply of suitably trained candidates to the expected number of consultant vacancies. Where there was evidence of significant changes in consultant opportunities, JPAC advised that the National Target be modified. Due to the proposed introduction of the specialist registrar grade, the work of JPAC has been frozen since January 1994.

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1 Hospital Medical Staffing - Achieving A Balance. Plan For Action 1987

3.5 Wales - Wales is closely allied to England with regard to its medical workforce and is a signatory to Achieving a Balance. The Welsh Medical and Dental Manpower Committee advises the Welsh Office on consultant expansion, personal assimilation to the associate specialist grade, staff grade allocations (10% limit) and SHO allocations. JPAC Wales advised the Welsh Office on increases and decreases in both senior registrar and registrar allocations.

3.6 Scotland - There are historical and organisational differences in medical workforce policies and planning between England and Scotland. Apart from the legal differences which affect some Acts and Regulations (eg. the NHS (Scotland) Act 1978, the NHS Remuneration and Conditions of Service (Scotland) Regulations 1991), formal targets for consultant expansion were not set, there has been no ceiling on SHO numbers, nor any staff grade quotas. The Scottish Council for Postgraduate Medical and Dental Education, acting through the Postgraduate Deans, now holds 100% of the basic salary costs of the training grades. Within a separate structure, the Advisory Committee on Medical Establishments (ACME) advises SOHHD on medical workforce issues. A new committee, the Advisory Group on Specialist Medical Training (AGSMT) has recently been set up to advise SOHHD on the implementation of the Calman Report on Higher Specialist Training.

3.7 Northern Ireland - Medical workforce planning differs again in Northern Ireland (NI). There are no regional controls on consultant numbers but there are for staff grade posts (for which there is a 10% ceiling) and associate specialists. Senior Registrar and Registrar posts are kept in balance with projected consultant needs. SHO numbers are not controlled but are monitored regularly. The province aims to be self-sufficient, training enough doctors to fill NI consultant vacancies. In planning, an allowance is made for losses resulting from doctors moving to posts in other parts of the UK or elsewhere. The Hospital Services Sub-Committee (HSSC) of the Department's Central Medical Advisory Committee (CMAC) advises the Management Executive on medical workforce requirements and related service developments.

General Practice

3.8 England and Wales - There is no direct control of the overall GP numbers in England and Wales, although the distribution of GPs to particular areas may be limited by the Medical Practices Committee refusing admission to the local FHSA medical lists.

3.9 Scotland - GP distribution is controlled by the Scottish Medical Practices Committees, but again no overall ceiling is set. The number of trainers is limited to 10% of the overall numbers of GP principals, which in turn limits the number of trainees.

3.10 Northern Ireland - In Northern Ireland, there are no regional targets for the number of principals in general practice or for list size. Some control is exercised through the regional Medical Committee which, using set criteria, makes recommendations to Area Boards on the admission of new doctors to the Medical

List. The number of trainees is determined by the Management Executive on the advice of the General Medical Care Sub-Committee of CMAC and is based on the forecast numbers of GP vacancies.

3.11 A summary of the various committee structures is contained in the tables at Appendix 3.

RECENT CHANGES IN THE NHS

3.12 Several major changes to the structure of NHS management and to medical education and training, have made a change in the workforce planning mechanisms imperative. By the end of 1993 it had become apparent that the advisory controls outlined above had not been working, especially in certain areas and certain specialties. This system has been rigid, unaccommodating and unrealistically detailed. The smaller size of the NHS in Wales, Scotland and Northern Ireland, and their more flexible and focused approach to workforce planning, reduces the need for change in these countries' jurisdiction.

NHS Management

3.13 The NHS and Community Care Act 1990 which introduced the purchaser/provider split, has led to Trusts having the freedom to employ staff appropriate to local needs and priorities, on local terms and conditions of service. More recent changes have further shifted responsibility and decision making towards local purchasers and providers with the proposed abolition of the authorities in England.

Funding the Training Grades

3.14 From 1 April 1993, Postgraduate Deans in England and Wales have had responsibility for 50% of the basic salary costs of hospital training grade staff. In Scotland, since 1 April 1994, the Scottish Council for Postgraduate Medical and Dental Education (SCPMDE) acting through Postgraduate Deans has taken over the funding of 100% of these basic salary costs.

Medical Education and Training

3.15 Changes in specialist medical training proposed in the Calman Report have been accepted by Government and implementation of the specialist registrar grade is underway. We are not yet able to comment on the short-term effects of reducing the time required for specialist medical training, on the demand for doctors in the hospital service. However, we do not consider that the *overall* demand for hospital doctors will increase, provided that this shorter training results in a higher ratio of consultants to junior doctors than at present.

Junior Doctors' Hours

3.16 In 1991 the Heads of Agreement on Junior Doctors' Hours[2] detailed action to secure real reductions in the hours of work of doctors in training. Regional task forces are responsible for local implementation and for monitoring progress. The task forces and their chairmen report to the Ministerial Group and Technical Group on Junior Doctors' Hours which give the initiative a strategic overview and have representation from the profession, the Royal Colleges, NHS Management and all four Health Departments.

3.17 Central funding was made available for consultant expansion and other local projects in situations where it would help reduce the hours of doctors in training. In 1993 in England, the controls on the number and distribution of SHOs were relaxed and the release of staff grade posts increased, in order to help achieve the New Deal targets on hours of work (a maximum per week of 72 contracted hours and 56 actual hours worked, by 31st December 1994). In Scotland funds were made available for additional consultant, staff grade and non-medical posts.

FUTURE MEDICAL WORKFORCE CONTROLS

3.18 Achieving a Balance (AaB), the New Deal and Hospital Doctors: Training for the Future, are closely inter-related policies and require a simplified advisory structure with appropriate professional representation to oversee and integrate their implementation with other workforce and educational issues.

Purpose and Principles

3.19 The main purpose of any new system proposed *for England,* is to continue to support the medical staffing policy goal of the Secretary of State for Health, "to plan and provide for an adequate supply of appropriately trained doctors". The replacement planning system needs to be streamlined, flexible and responsive, able to accommodate the present changes as they are implemented and allow for further decentralisation if necessary. The fundamental principles of safeguarding clinical standards, equality of opportunity and value for money must still apply. Although confined to England, the new system should take account of relevant activities and interests across the UK, and if possible and appropriate, the European Union (EU).

New Advisory Machinery for Medical Education, Training and Staffing in England and Wales

3.20 The new proposals aim to bring together the various functions and committees of JPAC, the Technical and Ministerial Sub-Groups of AaB and the New Deal Technical and Ministerial Groups, under a single steering committee. This committee is to be responsible for advising Ministers, the NHS Executive, the

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2 Hours of Work of Doctors in Training: the New Deal. London, Department of Health 1991

wider DH and the Welsh Office Health Department, on all matters of medical and dental staffing and education policy that require an input from the professions. Implementation of the Calman Report will also be included under this arrangement.

3.21 This committee was approved by the Minister for Health in November 1994 and an inaugral meeting was held on 7th December 1994. The **Advisory Group on Medical (and Dental) Education, Training and Staffing (AGMETS)** takes the form of a single top level committee, chaired by the Chief Medical Officer (CMO), with a remit of national strategic policy development. Sub-groups on specific topics and policies will be convened as required and report directly to AGMETS. Cross-representation of members with other groups (eg. Committee of Postgraduate Deans and the Standing Committee on Postgraduate Medical Education) will allow liaison and specific coordination where necessary.

Scotland and Northern Ireland

3.22 No changes to the current medical workforce planning mechanisms are envisaged at present.

Role of MWSAC

3.23 Within these present and future workforce planning arrangements, MWSAC alone will continue to make direct recommendations on staffing for the whole of the UK. Our projections are based on data aggregated from the four countries, to produce an overall target medical student intake for the UK. In this task MWSAC will remain separate and independent from other workforce planning and advisory arrangements.

RECOMMENDATIONS

3.24 Although our committee focuses on long-term workforce planning, our work must be related to and supported by, short to medium-term plans if we are to be successful. We decided therefore, that a recommendation on this issue could not wait for our second report and the Chairman wrote to Secretary of State in March 1994, outlining our suggestions for changes to the advisory committee structure in England, and many of the points we made have been taken account of in the new arrangements. The full text of this letter is at Appendix 4. Our recommendations may be summarised as:

> **We *recommend* that the workforce planning committee structure (which advises on hospital medical staffing issues in England) be revised to reflect recent and proposed changes in the NHS.**
>
> **The revised structure should enable employers of doctors, professional organisations and educational bodies to influence the development of medical staffing policy and should ensure effective monitoring of the implementation of policies and plans.**

4 SELF SUFFICIENCY, EUROPE AND THE CONTRIBUTION OF OVERSEAS DOCTORS

INTRODUCTION

4.1 In this chapter we review our position on self sufficiency and examine the evidence available of a possible shortage of doctors in the UK. We look at the flow of doctors into and out of the UK and consider the effect of doctors from EC and elsewhere on the UK workforce. Virtually all of the opinion expressed to our committee has stated that there are not enough doctors in the UK to meet current and future staffing requirements.

SELF SUFFICIENCY

4.2 In our first report we did not consider the objective of "self sufficiency" to be that all UK posts should be filled by UK doctors. Rather, we held that sufficient UK doctors should be trained in order that UK demand could be met, if the outflow of UK doctors to other countries was balanced by an inflow to the UK of EC and overseas doctors. We further observed that:

> *" The main attraction of employment in the UK to doctors from overseas, should be the acquisition of skills and knowledge relevant to medical practice in their country of origin. We should not be encouraging doctors to develop an international career at the expense of their home country, which may be unable to attract replacement medical manpower.*
>
> *At the same time, it is both inevitable and desirable that there will be global exchanges of doctors from continent to continent and from country to country. We support the view that "home produced" doctors will always be supplemented by doctors trained abroad."*

4.3 This approach has been confirmed by the 1993 Recommendation (Regulation R93/3) of the Council of Europe that all member countries of the Council should be broadly self sufficient in health personnel.

THE BALANCE BETWEEN UK AND NON-UK DOCTORS

4.4 Our projections, and those of previous workforce planning committees, have been concerned with the number of doctors that the UK will need in the future, based on the assumption that the number of doctors currently working in the NHS and Universities was adequate. Over the past two years we have been told repeatedly by the medical profession and workforce planners that there are insufficient doctors to meet the present demand for health care and too few doctors to fill the available posts.

Evidence of Shortages

4.5 We believe that there is a shortage of doctors and there are a number of indicators which suggest this.

Hospital sector

4.6 The NHS Executive has been monitoring the outcome of all consultant appointments advertised in the British Medical Journal since November 1993. Up until 15 October 1994, 2802 consultant posts had been advertised, and data obtained for 1882 (67%) of them. Of the 1882, <1% had been withdrawn or insufficient records had been kept to enable completion of the questionnaire, 229 (12%) attracted no applicants at all, 901 (48%) attracted three or fewer applicants, and 471 (25%) remain unfilled (Table 4.2). It has become apparent that in some of the major specialties (eg. anaesthetics, paediatrics, psychiatry) there are a significant number of instances when there are no applicants for advertised posts.

	Number of Posts advertised	Number of Posts Evaluated (%[1])	≤ 3 Applications (%)	Posts without Applicants (%)	Posts Remaining Unfilled (%)
All Specialties	2802	1882 (67)	901 (48)	229 (12)	471 (25)
Anaesthestics	492	338 (69)	170 (50)	63 (18.6)	119 (35)
Paediatrics	185	121 (65)	65 (54)	14 (11.5)	34 (28)
Obs & Gynae	84	53 (63)	21 (40)	4 (7.5)	12 (22.6)
Psychiatry	495	324 (65)	268 (83)	74 (22)	108 (33.3)

Table 4.2 Outcome Of Advertisements For Consultant Appointments: 11/93-10/94

[1] % of advertised posts - some posts may have been advertised more than once. Source: NHS Executive

General practice

4.7 There is an increasing number of reports concerning difficulties in filling GP vacancies and a decline in the numbers of doctors applying for GP training posts. In general practice (in England and Wales) approximately 1,600 new principals per annum are appointed, most of whom are likely to have completed vocational training recently. The number of GP trainees (E&W) decreased from 1,769 in 1983 to 1,653 in 1993, with most of this decrease amongst male trainees. During the same period, the number of GPs rose by 12% to 30,310, but the proportion of doctors aged under thirty years has fallen by over 2%. The number of GPs of sixty years or over has fallen by 6% since 1983.

Locums

4.8 A further indicator of shortages is the widespread use of long-term locums where posts cannot be filled permanently, and the reported difficulty in finding suitable locums for short-term appointments.

Overseas doctors

4.9 The UK might wish to attract overseas doctors for several reasons, not least of which is their important and necessary contribution to health service provision. A shortage of doctors in the UK has previously drawn doctors from overseas, many of whom settled in the UK permanently (before 1985). We do not know the future trends in the numbers of overseas doctors who will want to come to the UK for training, or what will influence those trends, but the opportunity for permanent immigration is no longer a possible incentive.

4.10 At present overseas doctors represent about 25% of doctors in training and as the length of training and the numbers of UK/EC doctors in training fall, the relative proportion of overseas doctors may rise. There is no guarantee of a continued flow into the UK of overseas doctors who may choose to go elsewhere, and yet we have established that a large proportion of our doctors in training - potential career doctors - will not remain here. Large numbers of overseas doctors training in the UK, will effectively divert resources which might have been invested in training doctors who are able to stay and work in the UK.

EUROPEAN DOCTORS

Directive 93/16/EEC

4.11 The free movement of doctors within the EC was guaranteed in principle by the Treaty of Rome. The medical Directives, the first of which were adopted in 1975, facilitated that principle by providing for the mutual recognition throughout the EC, of primary and specialist medical qualifications awarded by member states to EC nationals. Directive 16/93/EEC, which took effect on 5 April 1993, is a consolidation of the various medical Directives which had been adopted since 1975, but had no substantive effect beyond existing EC legislation.

Recommendation No R(93)3

4.12 On 22 March 1993 the Council of Europe's Committee of Ministers to Member States passed a Recommendation on Health Manpower Planning (R(93)3) which made the following main points:

- Member countries of the Council of Europe need an adequate supply of appropriately skilled people to deliver a good quality health service based on a holistic approach to health and disease;

- Health manpower planning is an essential element for achieving a proper balance between supply and demand;

- Greater unity between member countries should be pursued by the adoption of common regulations in the health field.

4.13 There are recommendations to each member state to:

- Plan its medical workforce to meet demand for health care services on its territory and to balance supply and demand; and

- Provide an education which will produce an efficient and effective workforce with skills responsive to future needs.

4.14 The Recommendation goes on to outline eight measures to establish a balance between supply and demand, recognising the need for statistical data on health personnel to inform the planners. These are set out in full at Appendix 6.

Migration of EU doctors to the UK

4.15 The GMC records the number of doctors from the EU who have been granted full registration. Data from 1991 up until March 1993, do not indicate any significant fluctuation in the overall number of doctors being registered. The full data are at Appendix 7.

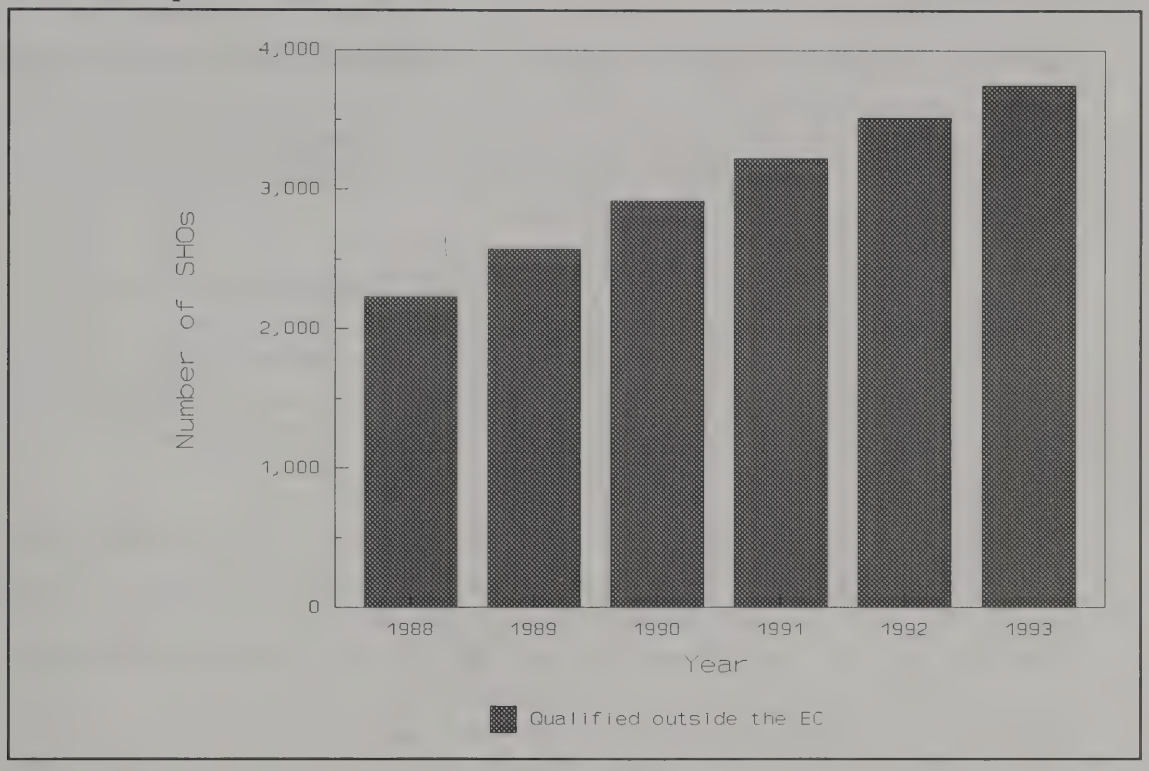
4.16 Hospital medical staffing statistics for 1988 to 1993 (England), show that the total number of EC qualified doctors working in the hospital sector, although still small, has been increasing. Most are working in the PRHO or SHO grades and are not expected to remain in the UK throughout their careers, although they are free to do so. 1,740 EC doctors were working in the Hospital and Community Health Sector (HCHS) in England at 30th September 1993, amounting to 3% of the total number of such doctors in that sector . Although there are reports of substantial increases in the numbers of EC doctors in some geographical areas, the overall numbers are too small yet to make a significant impact on the long-term supply of doctors. Full data are at Appendix 8.

OVERSEAS DOCTORS

4.17 We are aware that contrary to our previous assumption, the number of overseas doctors in the training grades has been increasing steadily (figure 4.1 and Appendix 9). This is most striking in the SHO grade where the percentage of doctors qualified outside the EC has risen from 20% in 1988 to 26% in 1993. The

percentage of overseas registrars was 36% and senior registrars 14% in 1993, amounting to 26% of the English workforce in these three training grades.

Chart 4.1 Senior House Officers in Great Britain That Qualified Outside the EC: September 1988-1993[1]



4.18 The majority of overseas doctors come to the UK for supervised postgraduate training in NHS hospitals and may remain in the UK for up to four years[2]. An examination of the trends in career patterns of overseas doctors is necessary because of the implications for doctor supply.

4.19 There is some evidence that other countries, for example the USA and Canada, which have shorter recognised programmes of postgraduate training, have been attracting overseas doctors who might once have come to the UK. Whether improvements in training facilities in developing countries or the introduction of high quality, relevant, structured training in the UK, following the implementation

[1] Source DH Statistics (England)

[2] Doctors without right of residence in the UK, may be granted, under the Immigration rules, a period of permit free training not exceeding four years, if the doctor can satisfy the Home Office that they intend to return home at the end of this period, or on completion of their training, whichever is the sooner.

5 THE DEMAND FOR DOCTORS

INTRODUCTION

5.1 In Chapters 5, 6 and 7, we consider projections of demand for and supply of doctors until the year 2020. While we acknowledge the uncertainty inherent in such long-term projections, it is necessary to consider the long-term, because the levels of medical school intake in the 1990s will affect the supply of doctors until at least the year 2040.

5.2 We see our role as planning the medical workforce required for the best health service that the country can afford. Forecasting the demand for doctors 20 or 25 years ahead is inherently speculative since demand will depend on future trends in many factors, all of which are themselves uncertain. Examples include: levels of health expenditure; levels of activity; medical advance; doctors' productivity; and doctors' pay.

5.3 Our first report offered tentative projections of the demand for doctors taking account of the likely growth of health expenditure. A major study of the future affordability of the medical workforce has produced a new set of forecasts for the demand for doctors (see chapter 12). However, it is felt that there are weaknesses in some of the assumptions adopted in that analysis and that further work is required to adjust the model developed by the consultants. That work could not be completed in time for this report. We are therefore treating its conclusions as provisional.

5.4 In order to provide an interim reassessment of the demand for doctors, this chapter returns to simpler methods of projection similar to those adopted in our first report. First, we describe an underlying model of the demand for doctors. Second, we remind readers of the projections made in our first report. Third, we review past trends in the growth of doctors, taking account of the growth of health expenditure and activity. Fourth, we make some international comparisons. Fifth, we compare the historic growth projection with the central projection from our first report. Finally, we discuss the plausibility of the different projections and arrive at a recommendation.

5.5 Our analysis covers both the Hospital and Community Health Service (HCHS) and the General Medical Services (GMS). Medically qualified staff in the Universities and General Ophthalmic Practitioners are included within the projections. The historical analysis is based on 1976/7 to 1992/3 because this is the period for which the data required are complete.

of the Calman Report[3] and the recommendations in the Programme of Action[4], will affect the flows of overseas doctors into the UK, remains to be seen.

UK DOCTORS GOING ABROAD

4.20 It has become increasingly common over the past ten years for doctors in the training grades, particularly at SR level, to go abroad for a period of training. The majority of these doctors will return to the UK after one or two years, especially now that the opportunities for permanent emigration to countries such as the USA, Canada, Australia and New Zealand have become more restricted.

4.21 The available data do not allow precise definition of the numbers of UK doctors who leave the country, either for training purposes or for long-term employment elsewhere. The only good evidence we have is from the Parkhouse studies of the early 1970s, when approximately half of the "wastage" figure (see Chapter 11) was due to emigration. The overseas list of the GMC is not adequately indicative of the scale of medical exportation as many doctors are understood to maintain their British registration even when working abroad long-term. We hope that evidence on this subject will be available from the recommissioned Cohort Studies of Doctors' Careers in the next few years.

CONCLUSION

4.22 There are strong indications that we are not self sufficient in medical staffing in the UK and we are placing too much reliance on doctors who have been trained elsewhere. We are certainly importing more doctors than we are exporting, and we feel it is inappropriate for a (relatively) rich country such as Britain, to remain a net importer of doctors.

4.23 We consider that non-UK doctors are now required to make up for a growing shortfall in the NHS of UK qualified doctors. Without remedial action this could lead to serious supply problems in the medium to longer-term, as insufficient home/EC doctors are available to meet expected and expanding career grade vacancies, which follow from Achieving a Balance, and the implementation of the New Deal and the Calman Report.

4.24 We would like to see an increase in the number of home and EC doctors, so that the number of overseas doctors in our health service does not need to rise further. This view has been carried forward into the modelling process at Chapter 6.

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[3] for which a separate working group has reported on the implications for overseas doctors arising from the principal report.

[4] "Ethnic Minority Staff in the NHS: A Programme of Action" NHS Executive December 1993

UNDERLYING MODEL OF THE DEMAND FOR DOCTORS

5.6 A very simple model of the demand for doctors in the HCHS underlies the discussion in this chapter. It is a model of "derived" demand. The Government can be expected to make available a certain budget for the HCHS in each future year. In accordance with the current organisation of the NHS, it will allocate this to Regional Health Authorities which then allocate to District Health Authorities and General Practitioner Fundholders (GPFHs) for them to purchase hospital and community health service activity from Trusts. The Trusts in turn will employ doctors to fulfil their contracts. Hence, the demand for doctors will be derived from the demand for services. The HCHS has increased, and will be expected to continue to increase, its overall efficiency in terms of outputs for resources. The demand for doctors, therefore, is likely to depend, among other things, on the growth of expenditure, the growth of activity and any changes in the productivity of doctors.

5.7 In the case of the GMS, it is neither appropriate nor possible to use such a "derived" demand model. There are no purchasers who are given budgets to buy GMS activity. Instead, growth in GP numbers is essentially determined by the decisions of individual practices and FHSAs, in the light of such factors as increasing workload, population changes, and perceived opportunities for increasing practice income. Over and above this, GP numbers are influenced by the distributional activities of the Medical Practices Committee. Accordingly, we project only the number of GPs for the GMS.

"CONTINUED GROWTH" DEMAND PROJECTION

5.8 In our first report, we assumed that continued growth in real HCHS (deflated by the GDP deflator) expenditure of 1.2% per annum would allow an overall growth of about 1.1% per annum in HCHS doctors, or 0.9% in terms of WTE. This would allow consultant growth in the region of 2.5% per annum, in accordance with the policy of "Achieving a Balance", provided there was very limited growth in the numbers of doctors in training. Higher and lower consultant growth variants were also considered.

5.9 In the case of the GMS, we heard evidence that a list size of 1700 is used as a guide by the Medical Practices Committee when deciding whether an additional GP should be recruited to a practice. We formed the view that this would become the average list size for all GPs by 2010. After weighing up all the evidence presented to us in 1992, we recommended that GP numbers would need to grow at 0.8% p.a.

5.10 Table 5.1 shows the results of these projections for total numbers of doctors in 2010. Our first report implied a growth in total doctor numbers of 1.0% per annum.

Table 5.1 MMSAC First Report Results: Doctor numbers (headcount) UK

	Base Year 1990	Projection	
		Year 2000	Year 2010
NHS doctors	96,400	106,200	118,200

HISTORICAL TRENDS

5.11 We have revisited past trends in numbers of doctors to check whether the projections adopted in our first report would entail a faster or a slower rate of growth in doctors numbers than has been experienced historically.

5.12 Chart 5.1 and Table 5.2 display historical trends from 1976/77 to 1992/93 in total doctor numbers in England for GMS and HCHS. Total numbers grew by 1.7% per annum.

Chart 5.1 Historic trends for HCHS, GMS and NHS for England. (Index of headcounts)

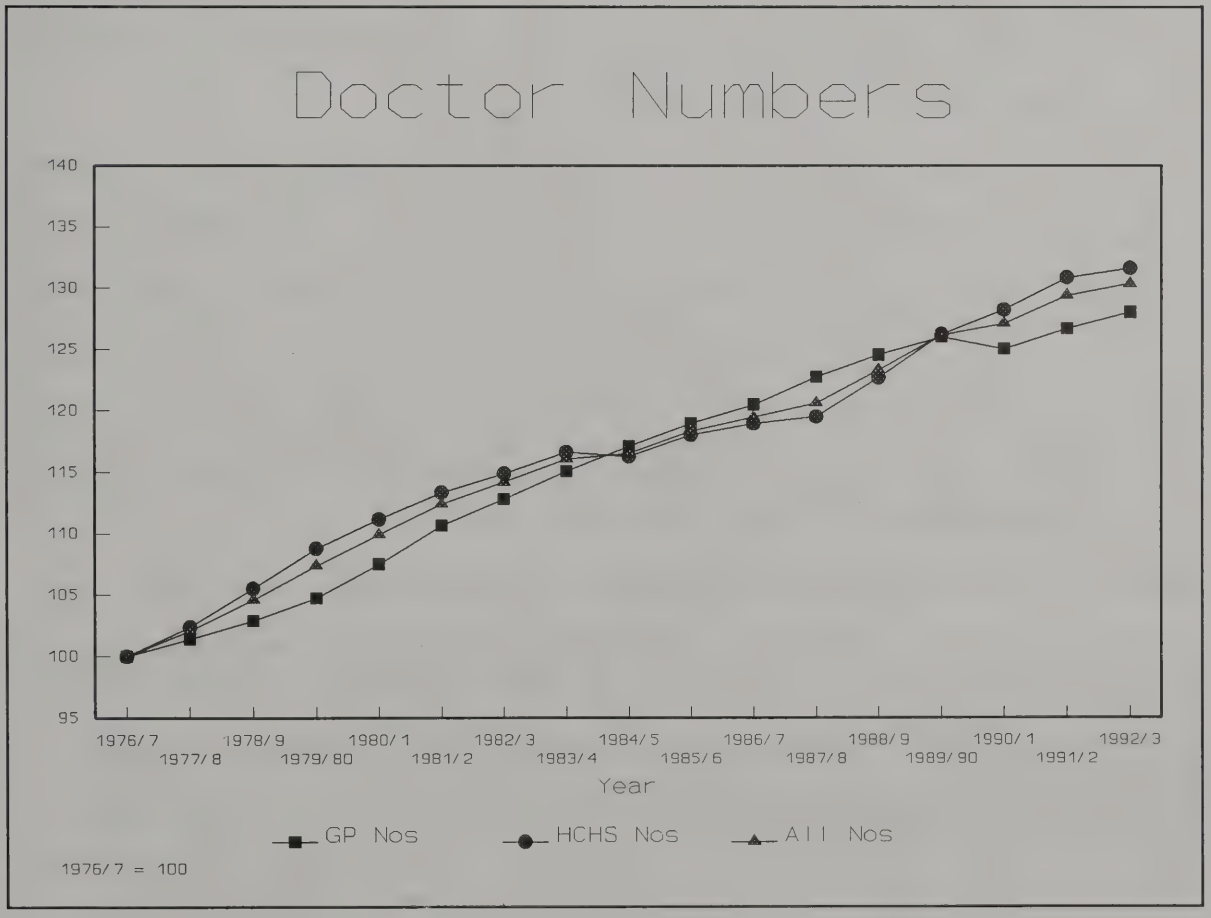


Table 5.2 Average annual growth rates for England of doctor numbers (headcount)

Historic growth rates (per annum)	HCHS doctors (numbers)	GMS doctors (numbers)	NHS doctors (numbers)
1976/7 to 1992/3	1.7%	1.6%	1.7%

5.13 The number of doctors rather than the Whole Time Equivalent (WTE) figure has been given. The WTE equivalent data for GMS are only available for the last few years, therefore trend rates have been given in numbers for both the HCHS and GMS to allow aggregation.

5.14 Is it possible to say anything about the determinants of the historical growth in doctor numbers? Chart 5.2 displays trends for the HCHS since 1976/77 in volume expenditure, activity, doctor numbers and doctor WTEs. Activity has been measured by the Department of Health's "cost weighted activity index" (CWAI) which combines changes in various components of HCHS activity (inpatient and day case episodes, outpatient attendances and accident and emergency services; Community Health Services covered include immunisation, district nursing and ambulance services) and by weighting them according to the expenditure devoted to each component in a base year.

5.15 Table 5.3 shows the average annual growth rates since 1976/77 in HCHS volume expenditure, the CWAI and HCHS doctor WTEs. As discussed in para **5.6,** the empirical evidence for the model suggests that activity rose more rapidly than the volume of inputs to (expenditure on) the HCHS. In other words, there was an increase in general efficiency. However, WTE doctors rose at about the same rate as the CWAI, ie. there was little improvement in this measure of the productivity of doctors. The main reason for increasing general efficiency was the falling length of stay in hospital and the savings from this were ploughed back into increased activity. There has been little saving of doctor input from falling length of stay, and therefore doctor WTEs have risen in line with activity.

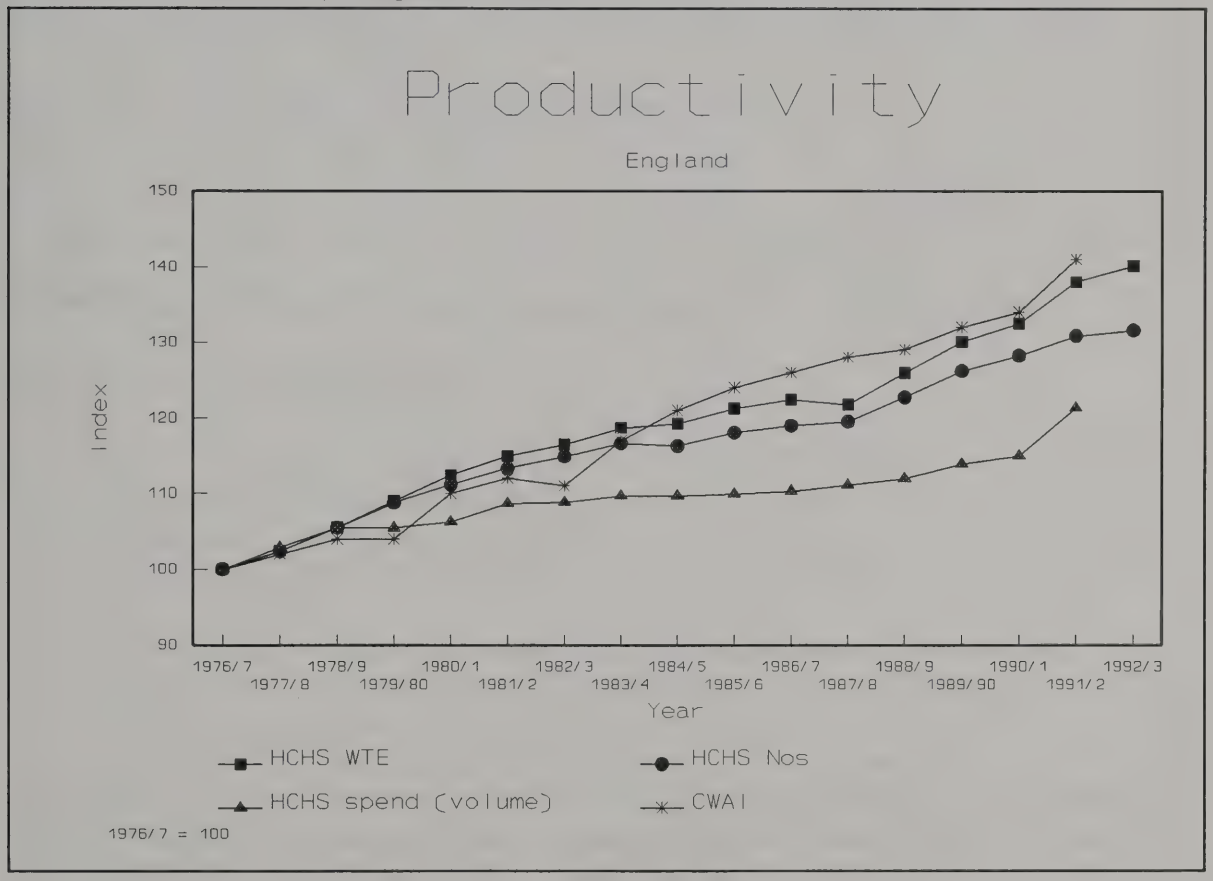
Table 5.3 Average annual growth rate for HCHS expenditure and CWAI

Historic growth rates (per annum)	HCHS CWAI	HCHS spend (volume terms)	HCHS WTEs
1976/7 to 1991/2	2.3%	1.3%	2.1%

CWAI = cost weighted activity index

5.16 All of the previous discussion refers only to HCHS. No such analysis is possible for GMS because of difficulties in measuring the inputs and outputs. Until recently we have not collected data in terms of WTE's for GMS, therefore we cannot build up a series which accurately measures the time worked. There is no systematic annual collection of estimates of GMS activity - although sample data are available from the General Household Survey (every year) and the GP Workload survey every four years.

Chart 5.2 Productivity England, 1976/7 to 1992/3

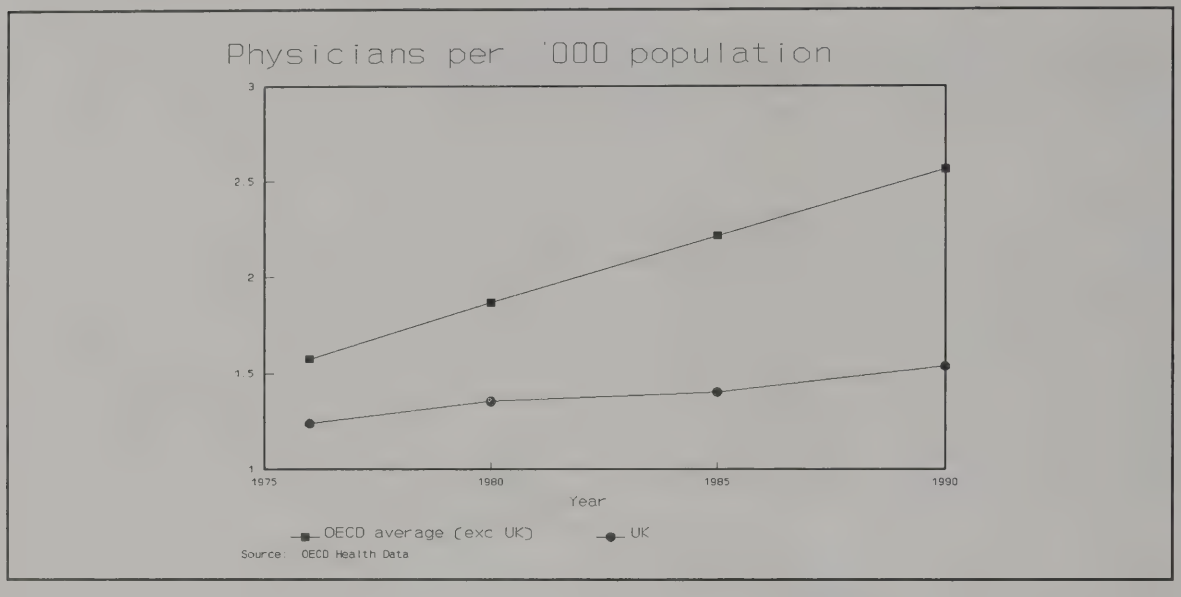


INTERNATIONAL COMPARISONS

5.17 We considered it important to examine international levels of medical staffing to see what could be learnt from a larger group of countries. We have compared the employment of doctors in the UK with that in other OECD countries. A statistical "health warning" attaches to these data. There is no guarantee that like is being compared with like. For example, part time working may vary between countries. Also, although the data are supposed to represent employed doctors, we think that they may sometimes refer to registered doctors. Bearing in mind these uncertainties about the data, Chart 5.3 suggests that UK's rate of physicians (all

doctors) per 1000 is low compared with the "OECD" average (23 countries other than the UK, although for some countries data are not available for all the years) and has been diverging at an increasing rate from this "OECD" average between 1976 and 1990. Table 5.4 provides the data by OECD member country.

Chart 5.3 Physicians per '000 Population: OECD and UK 1975 -1990



5.18 A possible explanation for the level and growth of employment of doctors in the UK is the level and growth of our health expenditure, compared with the average in the OECD. However, when we compare the UK with other OECD countries with a similar level of health expenditure per capita (Ireland, New Zealand, Denmark, Japan, Spain and Belgium), we find that they have a widely differing number of doctors per capita, some similar to and some higher than the UK. Such variation persists after standardising roughly for the design of health care system. This suggests that neither health care expenditure nor the design of health care system is a strong determinant of the rate employment of doctors.

Table 5.4 Physicians per '000 population for OECD countries

OECD PHYSICIANS PER '000 POPULATION 1990					
AUSTRALIA	1.9	GREECE	3.4	NEW-ZEALAND	1.9
AUSTRIA	2.1	ICELAND	2.8	PORTUGAL	2.9
BELGIUM	3.4	IRELAND	1.5	SPAIN	3.8
CANADA	2.2	ITALY	3.9	SWEDEN	2.9
DENMARK	2.8	JAPAN	1.6	SWITZERLAND	2.9
FINLAND	2.4	LUXEMBOURG	2.0	TURKEY	0.9
FRANCE	2.7	NETHERLANDS	2.5	U.S.A.	2.3
GERMANY	3.1	NORWAY	3.1	OECD AVERAGE EXCLUDING UK	2.6
				UNITED KINGDOM	1.5

Sources: OECD Health Data (1991) and UK Departments of Health (various sources and years)

RESULTS OF PROJECTIONS

5.19 We decided to make projections only for the total number of doctors needed. This is because our task essentially, is to make recommendations about the numbers of medical students to be trained. The proportions entering primary and secondary care may alter over time in response to changing circumstances.

5.20 Chart 5.4 compares the projection of total doctor numbers implied in the first report (1.0% per annum) with an extrapolation of the historical trend (1.7% per annum). The chart also shows the actual total doctor numbers for 1993/4 (the most recent year for which data are available). The rate of growth from our first report would imply a projection for 1993 which falls short of the actual doctors employed in the NHS in that year. This is because our first report projection assumed no growth in junior doctors, which we thought reasonable given the increase in consultant numbers.

5.21 Table 5.5 provides a summary of the results of the projections in our first report and historical projections for doctors numbers for the year 2020. We have developed these by updating the base year to 1993, and extending the end year for which projections are made to 2020.

Chart 5.4 Projections of Demand for Doctors UK 1990 to 2020

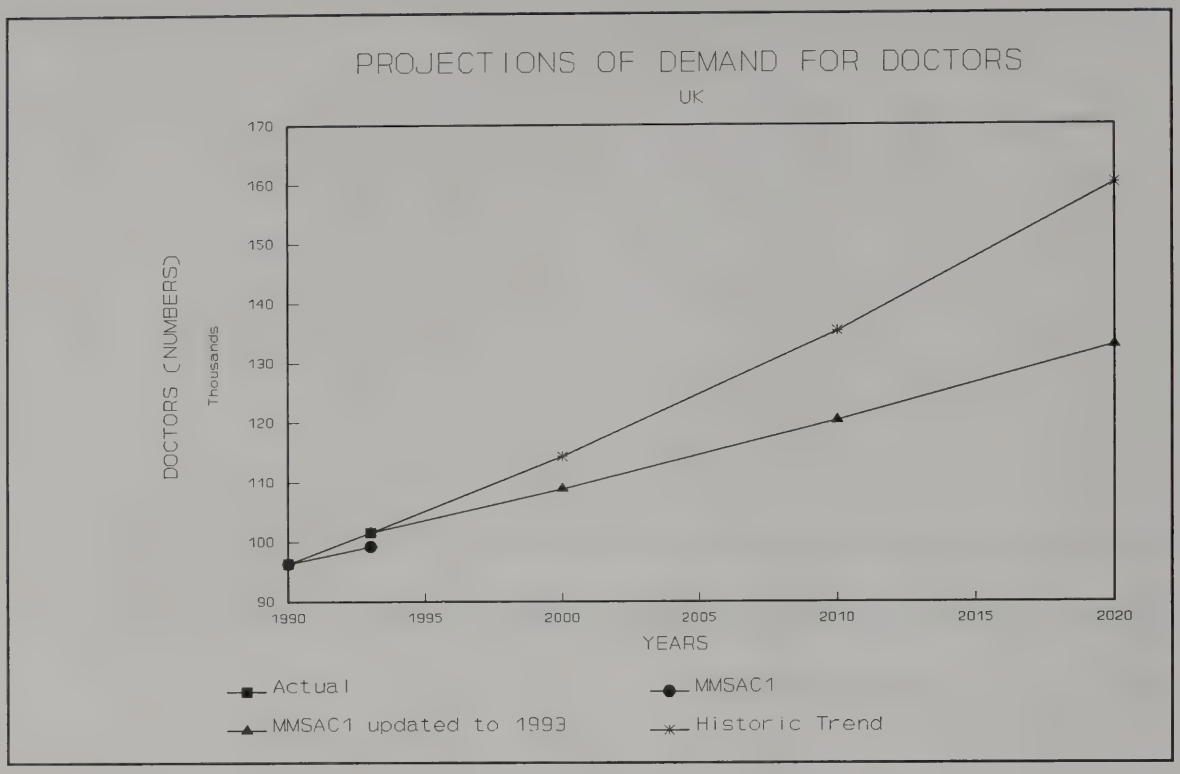


Table 5.5 Comparing the two projections with the base year

	Base Year 1993	MMSAC1 Year 2020	Historic Trend Year 2020
NHS (numbers)	100,900	132,000	159,000
NHS (WTE)	87,000	113,000	136,200

Note: WTE figures have been estimated for the base year and projection period as 0.856 of numbers based on the average English past ratio.

The pay cost of meeting alternative demands for doctors

5.22 Our earlier projections and historic trend projections diverge considerably by 2020, and it is worth considering the implications of each for the medical pay bill and hence for affordability. In 1993, the pay bill for medical remuneration (HCHS and GMS combined) represented 11.9% of total NHS expenditure. This percentage has risen steadily from about 10.9% in 1976, chiefly because salaries for the average

doctor rose by about 0.6% per annum faster than general HCHS running costs.

5.23 We have calculated the costs assuming that the trend in real pay and the historic growth rate in NHS expenditure both continue until 2020. If our earlier projections of doctor numbers were to occur, the share of medical remuneration of total NHS expenditure would fall to 11.5%. If the historic growth rate of doctor numbers were to prevail the share would rise to 13.9%. In the latter case, the increase in the projected share is largely due to doctors' salaries rising at a faster rate than HCHS pay and prices.

5.24 The rise to 13.9%, under the historic growth assumption would necessitate cost reductions in other areas. The past growth in this percentage may have been met by productivity gains in non-labour areas, in particular through reduction in length of stay, cost improvement programmes, and by productivity gains from other staff groups. Whereas there must be a limit, eventually, to reductions in length of stay it seems reasonable to anticipate continuing gains in productivity from other sources. In any case, there would be pressure for even more cost reductions in other areas and for increases in doctors' own productivity.

DISCUSSION

5.25 We have attempted to assess whether the future growth of demand for doctors is likely to be closer to the 1.7% historic rate or the 1.0% envisaged in our first report. There are arguments in both directions.

5.26 The following factors would suggest that the demand for doctors was likely to rise at around the higher rate discussed in this chapter (1.7% per annum).

5.26.1 The NHS appears to be undergoing a long term transition from a low technology-low throughput-low patient convenience organisation to a high technology- high throughput-high patient convenience organisation. These factors manifest themselves mainly in rising activity. Chart 6.2 indicates that there is a strong link between HCHS activity and HCHS doctor numbers. The NHS may wish to devote a rising proportion of its resources to this group of skilled workers in both HCHS and GMS. If total NHS expenditure in volume terms (using HCHS pay and prices deflator because NHS deflators are not available after 1990/91) continues to grow at about 1.7% per annum, we would expect that rate to have some relationship to the rate of growth of the demand for doctors.

5.26.2 The establishment of the internal market and the freedom of Trusts to set pay and conditions for medical staff, has decentralised the market for HCHS doctors in Britain. To the extent that such decentralisation gives Britain recruitment arrangements similar to most other OECD countries, they might be expected to encourage a faster rate of growth of HCHS doctors in the UK, resulting in less divergence between the UK and other OECD

countries.

5.26.3 There will be rises in the volume of demand for services in primary care.

5.26.4 Rising expectations, accompanied by policies such as the Patient's Charter, seem likely to increase the demand for more personal doctoring and longer consultations under the NHS.

5.26.5 There will be changing expectations of the workforce, in particular, a reduction in the number of hours some doctors are willing to work.

5.26.6 Some HCHS doctors will have an increasing non-clinical role, eg. clinical directorship and education.

5.27 Alternatively, the following arguments would be in favour of the lower growth rate projected in our first report (1.0% per annum).

5.27.1 The advent of the internal market might be expected, other things being equal, to encourage an increase in the productivity of specialists.

5.27.2 Continuing demands for further cost-efficiency will require the NHS to ensure that skill mix is optimised and hence may force a re-assessment for the demand for doctors given that doctors are a relatively expensive resource.

5.27.3 Trusts' freedoms to negotiate pay and conditions for doctors has led many commentators to predict a sharp rise in specialists' real remuneration (since specialists are scarce and have monopoly power). Such a rise might discourage Trusts from hiring extra doctors.

5.27.4 There is scope for removing some ineffective procedures which could lead to some reductions in doctor numbers.

5.27.5 Demand for doctors may have to slow down within a constrained budget, if acute length of stay cannot be reduced further (see paragraph 5.15). If the share of medical remuneration in NHS expenditure remained at 1993 levels, on the same assumptions the number of doctors would rise at 1.1%.

5.28 In addition, there are some possible structural changes in health care which may increase, reduce or leave unchanged the demand for doctors. Two examples discussed below are the shift from secondary to primary care and advances in technology.

5.28.1 The proposed shift from secondary care to primary care may, if there is straightforward transfer, have no net effect on the total number of doctors, assuming hospital doctors and GPs are equally effective. It may however reduce the total number of doctors, if the work could be undertaken more

efficiently and effectively by other non-medical staff, eg. nurse practitioners. If it is a case of outreach services being provided by the hospital in the community, then medical input may increase due to increased travel time and fewer patients seen in each session.

5.28.2 Technology/clinical practice changes may increase the demand for doctors if people who could not be treated before can now be treated. If each procedure can be undertaken more efficiently, however, then medical input per unit of output may decrease, although the total may be unchanged. The total demand for doctors might reduce if other staff groups could efficiently and effectively undertake the work. These issues are further discussed in Chapter 8.

CONCLUSION

5.29 We consider that a reasonable case can be made for either of the projections of 1.0% and 1.7% per annum. Accordingly, we carry both forward to our consideration of the balance between demand and supply (Chapter 7).

6 MODELLING THE FUTURE SUPPLY OF DOCTORS

THE FUTURE SUPPLY OF DOCTORS

6.1 In the previous chapter we have considered the future demand for the medical workforce, and assessed the factors that will influence it. In this chapter we consider projections of the future supply of qualified doctors available to meet that demand. We describe the way we have modelled the expected changes over the next 25 years; and we outline the assumptions used.

6.2 Supply is influenced by a number of variable factors, of which the following are particularly important:

- the level of intake to medical schools;
- leaving rates; the proportion of each annual medical school intake who do not continue for a full career as a doctor in the UK public sector;
- immigration of doctors from the EC and other countries;
- trends in retirement ages; and
- changes in the career structure to shorten the time spent in training grades.

6.3 Each of these influences may vary over time, and so each of our projections represents a judgement of possible outcomes, calculated in the light of present trends and of foreseeable future developments. We therefore present a "central" supply projection, based on assumptions about foreseeable future developments and the continuation of current trends in the medical workforce. We also outline a number of variant projections, to assess the effect of deviations from these assumptions.

CHANGES TO THE CENTRAL SUPPLY PROJECTION SINCE OUR FIRST REPORT

6.4 The actual growth between 1990 and 1993 in the number of UK qualified and EC qualified doctors was consistent with the projections in our first report. On the other hand, the fall in the number of overseas doctors that we projected, has not taken place; in fact there has been an increase, most markedly in the SHO grade. For this and other reasons we decided to change a number of the assumptions underlying our central projection, though the majority have not been altered.

6.5 Since the production of our first report, a new planning model has been developed and tested. This model is called the Workforce Planning Model (WPM), and like the previous model it uses various probabilities to assess where, in the medical career structure, successive cohorts of doctors will be placed over a number of years. A description of the model is given in Appendix 5.

6.6 This model uses much of the data from the modelling exercise for the first report. The baseline has been updated, to reflect the number of doctors in 1993, and several flow rates have been recalculated to reflect the more flexible structure of the new model.

6.7 As well as introducing the Workforce Planning Model and extending the projection to the year 2020, the only other changes to the central supply projection are as follows:

6.7.1 We have changed our projection of the future number of overseas doctors;

6.7.2 We have projected numbers of EC-qualified doctors separately from UK doctors;

6.7.3 We have made allowances for small reductions in wastage as a result of the planned changes to higher specialist training, as recommended in the Calman Report.

ASSUMPTIONS UNDERLYING THE CENTRAL PROJECTION

UK Qualified doctors:

6.8 Apart from the effect of Calman (see below), wastage rates remain at the levels assumed in the first report. These were calculated using a combination of data from the cohort studies conducted by Professor J Parkhouse and data from the Department of Health's Medical Manpower Record (MMR), which measures the flow of doctors in and out of the system between consecutive years.

6.9 The rate at which doctors rejoin the medical profession has been remodelled to reflect the structure of the new model, but is consistent with the rates used in the first report. Again, these were calculated using data from the MMR, together with data from the Parkhouse cohort studies. Further information is included in Appendix 5.

6.10 The increase of medical school student intake that we recommended in 1992 has been incorporated. An extra 250 medical school students each year from 1993 implies approximately an extra 215 new PRHOs each year from 1998. We have assumed that men and women will enter medical school in roughly equal numbers, in line with recent trends.

6.11 A further loss to the profession are those undergraduates who do not complete the medical course. This loss has averaged 10% in past years and is broadly in line with the average loss from all undergraduate courses. Our model assumes that the number of students graduating from medical school is 10% less than the intake to medical school five years earlier.

6.12 Doctors in the training grades are more likely to leave medicine prematurely, than doctors in the career grades. The career structure may therefore affect the supply of doctors. Thus, it is important to take into account the implementation of the Calman recommendations to reduce the time spent in the training grades. We have assumed that these changes will be fully implemented by the year 2000.

6.13 It is reasonable to assume that these changes, with the prospect of more rapid promotion to consultant, will reduce premature leaving rates in the training grades. We have therefore assumed that the annual leaving rates in the new specialist registrar grade will be 2 percentage points lower than those in the old registrar and senior registrar grades. Promotion rates have also been increased slightly, to model a small reduction of time spent in the training grades, for the years before full implementation of the Calman recommendations.

6.14 As in the first report, we assume that current trends towards earlier retirement will continue at a moderate pace, with retirements one year earlier during 1993-2000 than in the late eighties and two years earlier in 2001-2020;

6.15 A number of community medical officers (CMOs) and Senior Community Medical Officers (SCMOs) will be regraded from the community sector to the hospital sector. However, their numbers are not large enough to influence the overall supply figures, so we have not modelled this change.

EC qualified doctors:

6.16 With the further development of the European Community, it is expected that the number of EC qualified doctors working in the UK will increase. For our central projection we have assumed that the number of EC qualified doctors will increase steadily, reaching double its current level by 2020. This rate of growth is consistent with the trend over the period 1989-1993.

Overseas qualified doctors:

6.17 In the first report we modelled a gradual reduction in the number of overseas doctors, to reflect the gradual wastage of overseas doctors registered before April 1985, without any compensating net increase by more recent immigrant doctors. However, there is evidence that the total number of overseas doctors has increased between 1990 and 1993 and, given this evidence, it would not make sense to assume a future fall in the total number of overseas doctors. On the other hand, this would conflict with the aim of UK self sufficiency. We have therefore assumed, for our central projection, that the number of overseas doctors will stay constant.

VARIANT SUPPLY ASSUMPTIONS

6.18 The **variant projections** use the same assumptions as the central projection except as detailed below:

Variant A - Lower leaving rates

Wastage rates one fifth lower for all doctors.

Variant B - Overseas doctors decrease

The total number of overseas doctors decreases gradually in line with the following assumptions;

6.18.1 Pre-1985 overseas doctors are subject to the same leaving rates as UK doctors, but no new joiners and diminishing numbers of rejoiners.

6.18.2 The number of post-1985 doctors remains constant.

These assumptions are consistent with those made for the central projection in the first MMSAC report.

Variant C - Faster increase in the number of EU doctors

The number of EC qualified doctors grows steadily to 5 times the current level by 2020.

Variants D and E - Increase in medical school intake

These variants examine the effect of gradual increases in medical school intake. They are examined in more depth in the next chapter.

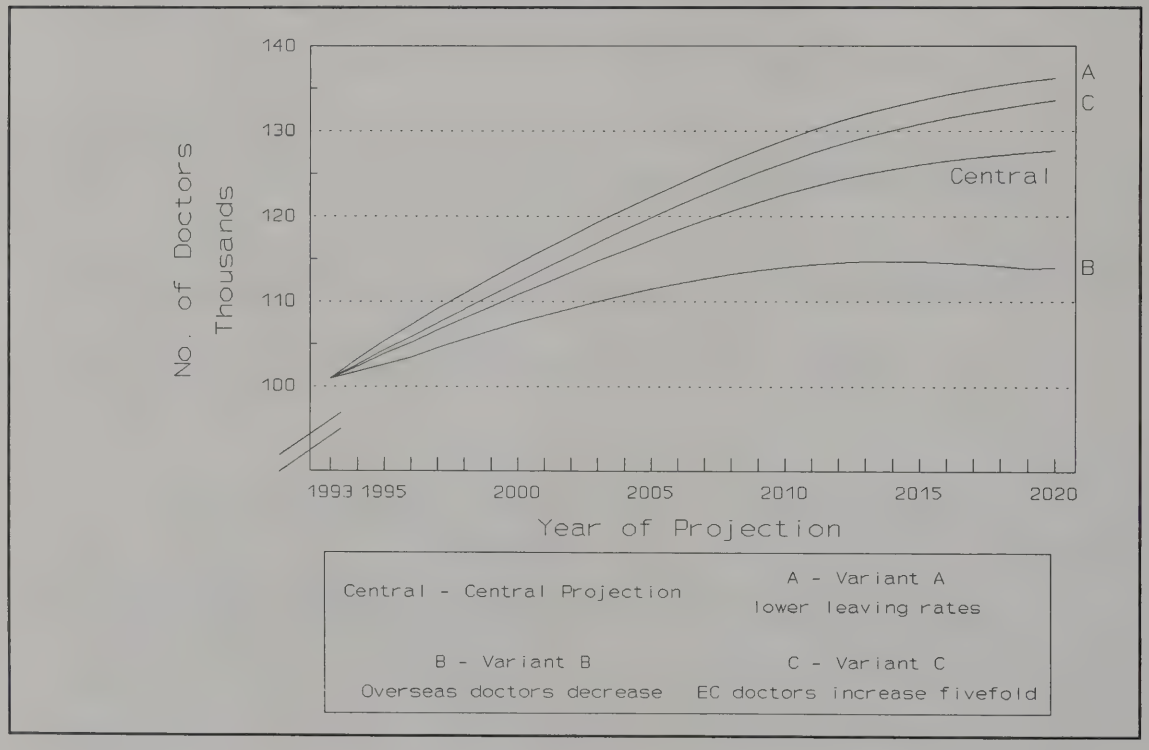
RESULTS

6.19 This section highlights the main results and examines the differences between the variant supply projections. The main results for all the projections are shown in Table 6.1, and Chart 6.1 shows the central supply projection and variants A-C.

Table 6.1 : Summary of Supply Projections.

Supply variants	Year 1993	Year 2010 net since 1993	Year 2010 additional from central variant	Year 2020 net since 2010	Year 2020 additional from central variant	Total supply in year 2020
Central variant	100,900	+21,100		+4,500		126,500
Variant A	100,900	+27,000	+5,900	+6,400	+7,900	134,400
Variant B	100,900	+12,500	-8,600	-1100	-14,200	112,300
Variant C	100,900	+24,800	+3,700	+6,700	+5,900	132,400
Variant D	100,900	+23,300	+2,200	+10,000	+7,600	134,100
Variant E	100,900	+23,900	+2,800	+13,600	+11,900	138,400

Chart 6.1: The central supply projection and variants A, B and C



6.20 In **all** the supply projections, the number of doctors grows at a moderate pace in the first few years, but the growth slows down in the later years. This is because the increase in the number of UK doctors, caused by the expansion of medical schools in the 1970s will have slowed to a trickle by around 2015.

Central Projection

6.21 The central projection shows a net increase, between 1993 and 2010, of 21,100 doctors. This is higher than projected in our first report, principally because of our changed assumptions on overseas doctors, but also because of lower wastage rates in the new Specialist Registrar grade and faster promotion to consultant and other non-training grades (where wastage rates are much lower). Beyond 2010, the central projection increases more slowly. There is a net increase in the number of doctors between 2010 and 2020 of just 4,500.

Variant B

6.22 Variant B assumes a falling number of overseas doctors, as assumed in the central projection in our first report. This variant would mean 8,600 fewer doctors than the central projection by 2010 and 14,200 fewer than the central projection by 2020.

Variants A and C

6.23 If we assume lower wastage rates, as in variant A, the projections of the number of doctors would be higher; 5,900 higher by 2010 and 7,900 higher by 2020. If the number of EC doctors grows more rapidly than at present, this would also mean more doctors in later years; 3,700 extra by 2010 and 5,900 extra by 2020. Combining these two effects would mean an extra 14,800 doctors by 2020, although even under these assumptions, the growth after 2010 is still moderate. To generate further increases beyond this point would require either growth in the number of overseas doctors or increases in medical school intakes to generate a further expansion of UK qualified doctors.

DISCUSSION

6.24 For the purpose of forming our recommendation on medical school intake, we needed to determine which of our supply projections should be given most weight and we concluded that the central projection, rather than any of the variants, should be used as a basis for planning. The variants indicate the magnitude of possible divergence from this projection, both up and down, but none of them commands greater credibility than the central projection for the following reasons:

6.25 For UK qualified doctors, the critical assumptions are those concerned with possible losses of doctors' years of service, premature leaving or time out from the NHS, and patterns of retirement. It is possible that the level of premature leaving from the NHS may be lower, in the next 20 years, than it was ten years ago, because there are signs that there may be fewer opportunities for British doctors to emigrate permanently to other developed countries. This argument would point towards variant A, which assumed substantially lower wastage rates. On the other hand, if there were to be significant growth of the medical private sector, this could tend to increase loss of doctors from the NHS, mitigating the above effect.

6.26 Moreover, we have been fairly modest in our assumptions about the rates at which retirement ages may fall. In addition, by the year 2015, the proportion of women doctors in the NHS will be approaching 50%, and for this and other reasons it is possible that there could be very significant changes indeed, in the arrangements for and amounts of part-time working and career breaks. This could reduce the supply of medical staff considerably.

6.27 Therefore, although there are some grounds for believing our "low wastage" variant, there are on balance no grounds for preferring it to the "central" projection.

6.28 Moreover, we believe it is right to plan for the supply of UK qualified doctors to be sufficient for the needs of the service to be met without any further increases in the number of doctors from outside the EC. It is possible that there will be a substantial increase in numbers from Europe, as illustrated in variant C. However, this is far from certain, and we should also have regard for the factors which might reduce supply, such as those in variant B (falling number of overseas doctors).

6.29 The central supply projection therefore represents a middle view, subject to variation either up or down. For this reason we have used this projection as a basis for developing our recommendations.

7 COMPARISON OF SUPPLY PROJECTIONS WITH DEMAND PROJECTIONS

INTRODUCTION

7.1 In the previous two chapters we have considered projections to the year 2020 of both demand for and supply of the medical workforce, and have noted that there is, unavoidably, a level of uncertainty about each. Nevertheless, it is necessary for us to give our considered judgement about the likely balance between them, and to make recommendations about the appropriate level of intake to medical schools.

MECHANISMS TO CORRECT IMBALANCES BETWEEN SUPPLY AND DEMAND

7.2 Our objective is to ensure that the supply and demand for doctors in a future period are approximately in line. An important method by which a foreseen shortfall can be met is by increasing the supply of training places. However, this mechanism suffers from the fact that training takes several years, and other influences can alter the balance more quickly. This fact, combined with the inherent uncertainty of the forecasting, means that it is not possible to ensure an **exact** match between supply and demand. Rather, our aim is to minimise the divergence between them, and to ensure that large imbalances are avoided.

7.3 We note, however, that small differences should be self-correcting through mechanisms other than adjusting training places. Thus a limited under-supply could be met by reductions in wastage rates (for example because vacancies across a wide range of specialties might increase the career choices of a trainee and thus encourage them to stay rather than leave training), together with an increase in the net inflow of doctors from the EC and abroad, or from other non-NHS careers such as academic research and pharmaceuticals. Doctors' remuneration could be increased to assist with all these aims, while the possibilities of substitution could be pursued with greater vigour.

7.4 Further work on the relative strengths of these adjustment factors is desirable as a longer-term project. In particular, we need to consider the influences leading to a doctor's decision to stay in or leave the NHS. There is a plethora of potential influences, but in general a doctor will decide on the basis of the attractiveness of the career relative to other opportunities, in the UK or abroad, for which he/she is qualified. Factors such as scope for promotion, stress, status and the opportunity to serve patients are key examples of motivating factors.

7.5 In some professions, pay is seen as perhaps the most important factor in determining supply. Thus if there is a shortfall, the employer will raise the level of pay to attract new supply, and *vice versa*. However, pay is not a main motivator for

medical recruitment as illustrated in a recent study[1] where pay did not appear on the list of reasons for wanting to study medicine.

IMPLICATIONS FOR PLANNING SUPPLY

7.6 We could make two types of error in forecasting the demand for doctors, assuming that the supply is to be determined accordingly. We could overestimate the demand, train too many doctors and lose the individuals concerned to other parts of the economy or abroad. Alternatively we could train too few doctors and either struggle with vacancies or continue to recruit more doctors than planned from abroad.

7.7 An over-supply of doctors represents resources wasted in training, and might lead to medical unemployment. But apart from this it would have beneficial effects for the service, as a generous level of supply would make it easier for NHS Trusts and GP practices to recruit high quality doctors promptly, to the places where they were needed.

7.8 On the other hand, as noted above, the effects of under-supply can be mitigated by economic mechanisms and by actions open to the Service. By these methods a small level of under-supply could be accommodated. However, these adjustments will only be sufficient if the imbalance is small.

7.9 The second error might seem to be less damaging than the first because we would at least have saved on training costs. However, the damaging effects of shortage should not be underestimated, and even if the shortfall could be recovered by other mechanisms, it might drive up the price of doctors, which could offset any savings in training costs. Moreover a severe or sustained shortage would inevitably have undesirable consequences for health care. Thus there is a need for planning the supply of training places to avoid large imbalances in either direction.

REGULAR INCREASES IN MEDICAL SCHOOL INTAKES

7.10 The number of doctors in the NHS has risen every year, and our projections assume that demand will continue to grow, at a rate probably between 1.0% and 1.7% per annum. In the next 20 years, the required increase in the supply of UK doctors would be greater if, as we envisage, the proportionate contribution from overseas doctors declines. At the very least, there is good reason to expect that increases in the desired number of UK trained doctors will continue.

7.11 In the past, increases in medical school places have been introduced only sporadically. (Until we recommended an increase in 1992, the last increase had been

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[1] Doctors and Their Careers: A New Generation Isobel Allen, Policy Studies Institute, December 1994. The main reason for entering medical school given by 24% of 1986 qualifiers was that it was a "good interesting career"

in the early 1970s.) The increases have therefore needed to be substantial. It could be argued that this is a reasonable method of planning, because such changes generate increased supply for several subsequent decades, as more and more of the larger cohorts serve in the NHS. However, this method carries the risk that the optimal time for the next such step increase may be missed. If action to increase the intake were delayed too long on any occasion, the result could be serious shortages for an extended period.

7.12 We therefore believe that it would be better to adopt a policy of increasing the intake of medical students each year, by a moderate amount. We would still need to consider the level of intake periodically, and recommend adjustments when necessary, either up or down. However, in the long term fewer such interventions should be necessary than under the present system, and the balance between supply and demand would have an in-built stability which is currently lacking.

7.13 We believe such a policy might also have advantages for planning. Continuing steady change can be planned more easily than occasional large changes, and a clear policy such as the above would allow the Department for Education and other bodies to plan in advance for the gradual expansion of existing medical schools.

7.14 Having considered this long term strategy, we now consider the present outlook for the balance between supply and demand.

THE ADEQUACY OF CURRENT SUPPLY

7.15 Our starting point here is to consider whether there is evidence of a *current* shortfall in supply. No hard and fast indicators of this exist, but there are a number of pointers which suggest that the NHS's demand for doctors is beginning to outstrip the readily available supply. These have been discussed in Chapter 4 and may be summarised as:

7.15.1 There continue to be persistent consultant vacancies in particular specialties; in part this may be caused by imperfections in the planning of higher specialist training, but it could also be an early indicator of an overall shortage.

7.15.2 There are increasing reports of difficulties in filling GP vacancies.

7.15.3 There is consistent anecdotal evidence that locum doctors are becoming hard to recruit, particularly for long term appointments;

7.15.4 Finally, we regard the continuing increases in junior hospital doctors from overseas as the most conclusive evidence of a developing shortfall of supply of UK qualified doctors. Trusts are recruiting more and more junior doctors from other European countries and beyond. This indicates that there are insufficient UK doctors to meet their requirements.

7.16 Evidence of a current shortage does not by itself prove that supply and demand are necessarily out of line for the future. However, in the present circumstances it strongly suggests this, bearing in mind that medical school entry has risen little over the last 15 years, while the size of the medical workforce has continued to grow. Later in this chapter we present a comparison of the supply and demand projections, which confirms, in our view, that action is required now, to increase supply for the future.

COMMENTS ON GROWTH ASSUMPTIONS

7.17 As outlined in chapter 5, our view is that the rate of growth in demand is likely to be in the range of 1.0% to 1.7% per year. To be on the safe side, we would therefore need to recommend a level of supply sufficient to meet a 1.7% growth rate, if that should take place. However, when accumulated over a 25-year period, such a growth rate would imply a large change in the amount of health care being delivered. This timescale would be bound to provide opportunities for organisational changes, and these might be such as to reduce the requirement for doctors within the overall health-care sector.

7.18 For this reason, we believe that **for the time being** it is reasonable to plan a level of supply which falls short of the higher demand projection, ie to plan on the assumption that demand will grow at a rate midway between 1.0% and 1.7% per annum. But we also recommend that the rate of growth in doctor numbers should continue to be kept under review.

COMPARING SUPPLY AND DEMAND

7.19 Chart 7.1 shows both demand projections, together with the central supply projection and two additional supply variants. The central projection does not include any further increases in medical school intakes, beyond those recommended in our first report. The extra variants show the effect of increasing medical school intake steadily to meet higher levels of demand.

7.20 The assumptions underlying the new supply variants are as follows:

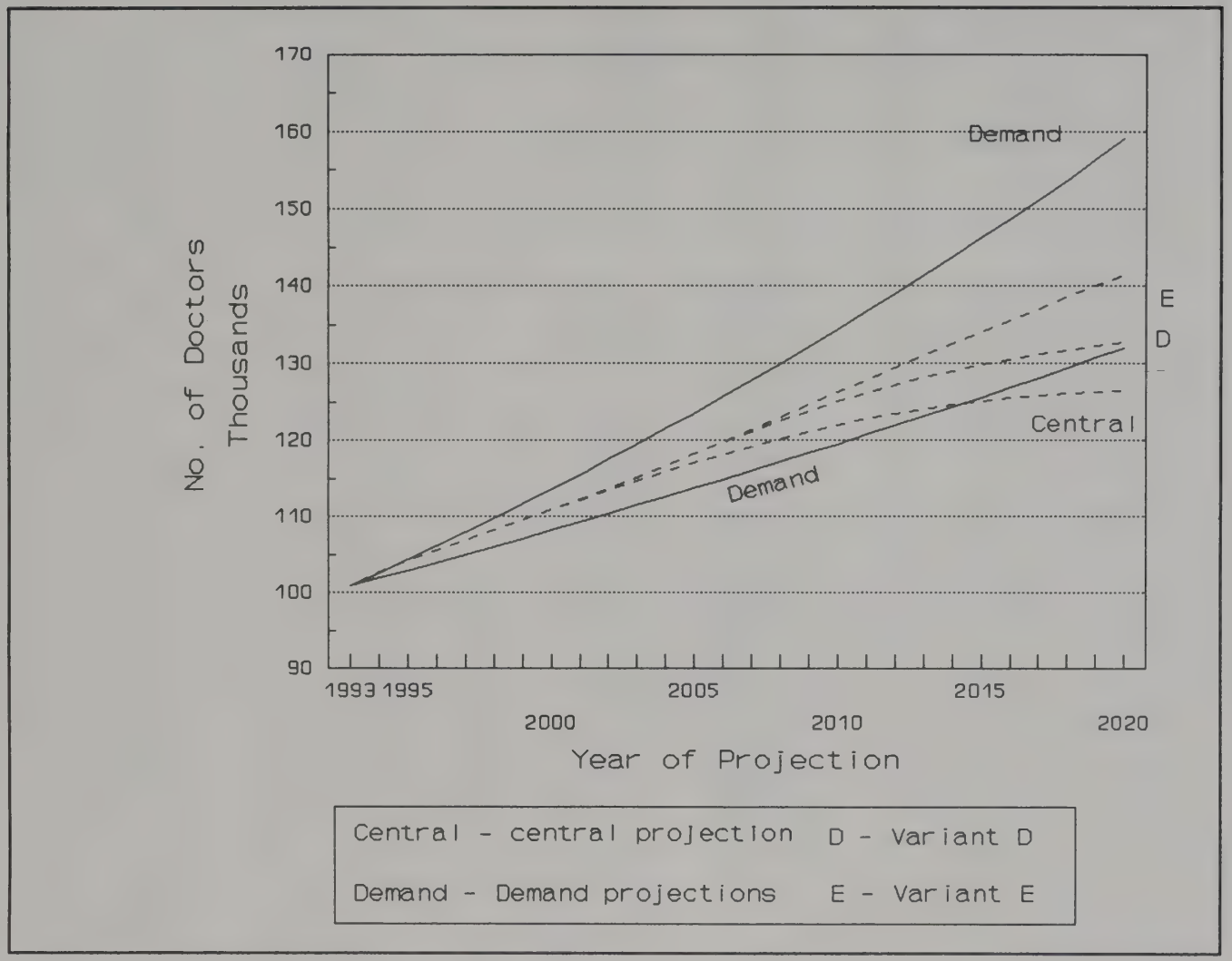
Variant D - Short term increase in medical school intake

The number entering medical school is increased by 100 each year, starting in autumn 1996, until the year 2000. From 2001 to 2020 there are no further increases.

Variant E - Long term increase in medical school intake

As in Variant D, except that medical school intake continues to increase by 100 each year from 2001.

Chart 7.1 Comparison of demand projections with various supply projections



Implications for medical school intake

7.21 Chart 7.1 shows that the central supply projection lies between the two demand projections for the next few years, but falls below the lower demand line in the later years of the projection. Although these projections are subject to uncertainty, this suggests that a further increase in medical school intake will be required sooner or later, if supply is to be adequate at the end of the forecast period.

7.22 It is clear from the chart that our variant E supply projection broadly keeps pace with the midpoint between the two demand projections. This suggests that moderate increases in medical school intake each year would, for the time being, allow us to keep supply reasonably close to demand. We are planning an increase in medical school intake equivalent to an increase of 100 students each year for five years from 1996, which is in line with variants D and E. This would amount to an annual increase as shown in Table 7.1. Implementing increases with extra annual specificity would not be easy for the Higher Education Funding Councils so, we have instead framed our formal recommendation in terms of a target to be met by the year 2000.

> **We *recommend* that the Government should plan for a gradual increase in medical students for five years from 1996 to arrive at a maximum annual target intake of 4970 by the year 2000.**

7.23 Continued growth in variant E depends on regular increases of 100 per annum in medical school intake continuing from 2001 onwards. We therefore expect that, on present evidence, regular increases of this magnitude will probably have to be made before long.

The need for continued monitoring

7.24 We clearly need to keep the situation under review, as any variation between our supply and demand projections and actual events could alter the outlook in either direction. In particular, if the evidence of the next few years were of growth in the workforce continuing at around 1.7%, this would suggest that a supply shortage was developing. In that event, a reassessment of the likely adequacy of future supply would become urgent.

7.25 Correcting such a shortfall would become increasingly difficult the longer we delayed an increase in medical school intake. Any increase in intake takes five years to affect the supply of qualified doctors. This means that, if demand continues to grow at current levels and we do not take early action, there could be a considerable shortfall in supply for a number of years. Quite apart from the effect on provision of service, this would imply that at some point there would need to be a large step increase in medical school numbers.

7.26 Conversely, if demand in reality follows the lower projection it would be possible to stop the increases at an early stage.

Table 7.1 Proposed Increase in Medical School Intake.

Year	Additions to 1992 quota	Total Student Intake	Overseas Quota 7.5% (92 quota+)
1995	-	4470	336 -
1996	100	4570	343 (+7)
1997	200	4670	350 (+14)
1998	300	4770	358 (+22)
1999	400	4870	365 (+29)
2000	500	4970	373 (+37)

OVERSEAS MEDICAL STUDENTS

7.27 We have been advised of the increasing demand for places in UK medical schools from overseas. This is particularly marked from those countries with fast growing economies where local demand for health care outstrips the local supply of doctors. We have been made aware of the potential advantages to the UK in terms of international trade, economic and diplomatic influence.

7.28 Set against the demand for overseas places is the fact that excess capacity in medical schools is limited and we must give priority to training doctors for the UK using any spare capacity for overseas intake. In this report we have not recommended altering the proportion of medical students entering UK medical schools from overseas. The current quota is 7.5% of intake and an uplift in the total intake will automatically bring about a small increase in the overseas student quota. If a smooth increase in intake were achieved this would have the effect shown in Table 7.1. Subject to resolving any cost burdens on the NHS and to findings ways of ensuring that the overseas students's home countries reap the benefit of their medical training, we would like to see the need for a quota on overseas medical students, reviewed.

COST IMPLICATIONS OF ADDITIONAL STUDENTS

7.29 The three supply projections outlined above would have different cost implications. We have been made aware by the England Department of Health of a planned change for 1995/6 in funding the Service Increment For Teaching and Research (SIFTR) which diverts the 'R' element to a separate funding stream. We have therefore used estimates of SIFT (ie excluding R) to estimate the cost of the base-line and our recommendation. The Additional Cost of Teaching (ACT) in Scotland is also under review, taking account of the Culyer Report.

7.30 Each undergraduate medical student is funded over 5 years (2 preclinical years and 3 clinical years). The funding has two main component costs:

costs to the Education Departments which are £77,500 per student (figure for England in 1994/5 prices) for the full five year undergraduate course (includes Funding Council grant, tuition fees and student support but not capital funds);

SIFTR is paid to the NHS and supports each medical student over the three clinical years of training. At 1994/5 prices and including capital charges but not research the amount of SIFT per student, for each clinical year, in England would be £35,573 per student outside London - and £38,088 per student in London.

The cost per student for the five year course is therefore in the range £184K to £192k per student at 1994/5 prices.

7.31 The level of funding in the UK at (1994/5 prices) with 5 intakes of 4,470 pre-clinical students would be of the order of £830m. Under our central projection, this would stay the same throughout the period of projection (in real terms). Under variant D, the increase in medical school intake of 500 students annually by the year 2000 would increase costs annually by around £93m.

7.32 These figures are illustrative and may not reflect the actual costs to the NHS. An Advisory Group on the Service Increment for Teaching (SIFT) has been established and is expected to report to Ministers by March 1995. The costs attributable to additional undergraduate clinical students will need to be considered in the light of that report.

Accommodating Additional Students

7.33 We have considered the current capacity for accommodating additional medical students, as medical schools are not indefinitely expandable. We were advised in July 1994 by the Higher Education Funding Councils that UK medical schools outside London could accommodate a further 222 students at present. Some universities have told the HEFCs that they will not be able to absorb further expansion without the provision of additional recurrent grant. We therefore recommend that the HEFCs have regard to the desirability of achieving a cost-effective expansion in allocating the extra places. This should take account of costs both to the HEFCs and to the NHS.

7.34 The proposed new target is in excess of currently declared spare capacity. However, we believe that an increase of this magnitude can be accommodated over a five year period provided that additional intake is staged. The advance warning of increases to the target would give universities time to consider how to accommodate more students. We do not think that it is necessary to give consideration to a new medical school at this time.

We *recommend* that higher education bodies have regard to the desirability of achieving cost effective expansion in planning for the increased target.

7.35 However we are aware that 269 students in excess of the current quota entered medical school in October 1994. This excess is said to be due to better than expected 'A' level results which obliged universities to honour the places offered. An ad hoc increase of this nature was unhelpful for several reasons;

it puts a strain on the infrastructure of the medical school which might have implications for the quality of teaching;

it takes no account of the resources likely to be available for clinical training of the additional students;

if unchecked, such increases could cause workforce difficulties in the future.

7.36 It is for the Secretary of State for Health to decide whether to increase the annual student intake target which was set at 4470 in 1993. Our recommendations set out below are made on the basis of the arguments set out in this report and take no account of the actual 1994 intake.

RECOMMENDATIONS

We *recommend* that the Government should plan for a gradual increase in medical students for five years from 1996 to arrive at a maximum annual target intake of 4970 by the year 2000.

We *recommend* that higher education bodies have regard to the desirability of achieving cost effective expansion in planning for the increased target.

8 MEDICAL TECHNOLOGY

INTRODUCTION

8.1 Our first report identified advances in medical technology as one of the important changes occurring in medical care. We considered whether the impact of new technology increased or decreased the demand for doctors and concluded that it appeared usually to lead to an increase in activity. A more stringent analysis is still lacking as evaluation is difficult, technological change is so rapid and continuous that the complicated effects on manpower inevitably lag substantially behind.

8.2 Medical technology is an area where uncertainties are paramount, but there is a growing awareness of the importance of identifying those technological advances which may significantly affect the delivery of health care. These future effects may concern the ability to diagnose, treat, cure or eliminate disease states. They may concern changes in the deployment of health personnel, prioritisation of resources and services, or education and training. A number of recent initiatives in the UK are attempting to rationalise the direction of technological development and this may enable better prediction, if not control, of the consequences for the health service.

THE DIRECTION OF FUTURE TECHNOLOGICAL DEVELOPMENTS

8.3 The pace of development of health technologies is increasing, the interval between scientific discovery and practical application diminishing and the opportunities and directions for further developments continually expanding.

8.4 The White Paper "Realising our Potential"[1] outlined a strategy to seek solutions through research, to problems in public health and health and social services. Key areas identified include medical engineering, expansion of information technology, developments in genetics, transplantation, vaccination and non-invasive and predictive tests for disease. The NHS Research and Development (R&D) programme created in 1991, supports the promotion of health and the provision of health care with Regional programmes being set up to address local priorities and to take forward central initiatives such as The Health of the Nation targets[2]. Other work will include the cost-effectiveness of advances in the fields of pharmacology, medical devices, screening, imaging, genetics and medical procedures.

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1 Realising our potential. A strategy for science, engineering and technology. HMSO, May 1993

2 Existing targets: coronary heart disease and stroke, cancers, mental illness, accidents, HIV/AIDS and sexual health; Five further target areas: rehabilitation, health of the elderly, asthma, back pain and drug misuse.

WORKFORCE IMPLICATIONS

8.5 We have reviewed some of the areas of medical technology which are transforming the scope of clinical medicine and which may affect the future demand for doctors. In particular we considered pharmacology, diagnostic, therapeutic and information technology and medical devices, with attention to the possible implications for the overall medical workforce requirements. As the changes in medical practice resulting from advances in medical technology are occurring concurrently with logistical changes in the health service - involving where and by whom care is provided - we could not identify which professional groups might be more likely to be affected in workforce terms.

8.6 The effects of developments in the fields of pharmacology, diagnostic technology and areas of therapeutic technology such as minimal access therapy (MAT), genetics and transplantation, on the future medical workforce are unpredictable. Although some advances may reduce the need for or length of medical intervention for individuals, it appears that the more that can be done for patients, the more there is potentially still to do.

Pharmacology

8.7 New drugs, new methods of production and new delivery systems often increase the number and type of patient that can be offered therapy. Some therapies (eg. vaccines) can have a major impact on the incidence of certain diseases and so reduce subsequent medical interventions; other developments may result in prolongation of life even if not cure of the disease. There are as a result, patients who live for longer than previously and continue to require treatment and follow-up. In living longer, patients may also develop side effects or new pathologies, which in turn require medical attention.

Diagnostic Technology

8.8 The demand for and development of diagnostics and imaging continues to expand, evolving towards faster, non-invasive applications some of which can be used in community clinics or in the home. New methods may prove quicker, more accurate, reliable and cheaper than current methods. As the number of potential applications continues to increase, more prospective medical work is identified, with increased demand for access to those technologies and personnel trained in their use.

Health Screening

8.9 The advent of widespread and easy access to effective health screening could have a significant impact on the medical workforce. It may, in time, become practical and even expected to screen all patients for genes predisposing to common forms of cancer, heart disease, mental illness and birth defects. Screening programmes to detect and treat common, potentially fatal conditions as early as possible would be expected to improve the morbidity and mortality statistics for these diseases. Whether increased numbers of doctors would be needed for the detection

and subsequent treatment, counselling and follow-up of additional patients, or whether the reduced morbidity associated with such early detection and treatment would require fewer staff, is not clear.

8.10 Health screening could offer an improved quality of life to patients, but it will result in even larger numbers of patients, many of them completely healthy, receiving health care. There are too, serious ethical issues involved in some screening tests (eg. antenatal screening for cystic fibrosis or the inherited predisposition to breast cancer). The resources allocated to this form of health care will require better understanding of the cost-effectiveness of different interventions in the development of disease and will to a great extent, determine the further resources that may be necessary to manage the health needs identified.

Therapeutic Technology

8.11 An increasing proportion of surgery now uses minimally invasive techniques, particularly general surgery, urology and gynaecology. The Working Group on **minimal access therapy**[3] found that waiting lists for MAT are lengthening in all centres which provide this service, as a greater number of patients may be suitable for a procedure using minimally invasive rather than conventional techniques. MAT often takes longer than the conventional procedure and time to learn and teach the new techniques additionally affects patient throughput. A greater proportion of this form of operating is being done by consultants. It is a technique which lends itself to day surgery and reduced hospital stay, leading to potentially complex effects on the medical workforce. For example, the time taken to perform one patient's operation may be increased, the time taken for inpatient care reduced and their requirement for care in the community likely to be increased. The number and type of doctors involved in the different phases of care are likely to change and may eventually vary in different localities.

8.12 The application of molecular **genetics** to clinical services may have a major impact on prevention and treatment of disease. In addition to screening, gene therapy for some single gene disorders (eg. cystic fibrosis, sickle cell disease) and conditions predisposing to cancer (eg. familial adenomatous polyposis) are already undergoing clinical trials. Gene transfer may become more widely used in treating cancer, immune and inflammatory diseases and in tissue implants. Further development of gene therapy will depend on progress in integrative biological research, costs, risks, the availability of alternative treatments and certain ethical complexities. It is likely that the applications of genetic knowledge will soon cause a substantial growth in the demand for these services.

8.13 Organ **transplantation** can greatly improve the quality and length of life and is a cost-effective treatment when compared with continuing treatment of a chronic condition. Transplantation of other body parts (eg. limbs, joints) which are not life

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[3] Minimal Access Surgery: Implications for the NHS. Report of a working group chaired by Professor Alfred Cuschieri. March 1993

saving but which increase quality of life are expected to become a reality, due to advances in immunosuppressive therapies and microsurgical techniques. The technology and the demand for transplantation are there; it is the availability of donor parts, ethical considerations, funding and the supply of suitably qualified surgeons that constrain the development of this service. The direction of the available resources away from or toward interventions such as this, may substantially alter the composition of the necessary medical workforce, particularly at a local level.

Medical Devices

8.14 A vast and increasing array of technological products are available for use in or on patients. Some of these products are modifications or enhancements of conventional devices that allow an increase in the scope of clinical activity by extending the suitable case-mix, or by reducing the cost of a procedure, inpatient stay, morbidity or operative manpower. Others allow completely new procedures and techniques that have only become feasible with the advent of particular items of equipment (eg. lasers, hip prostheses). New technologies allow more to be done for more patients and more to be done for individual patients. It appears that either by creating a new demand, or by allowing a greater proportion of existing demand to be satisfied, technological developments increase the need for a trained workforce.

Information Technology

8.15 The continued expansion of knowledge, the desire to control the efficacy and cost of treatments and the increasing complexity of diagnosis and treatment will tend to expand the market for advanced information and communication systems in health care. An Information Management and Technology (IM&T) Stategy for the NHS in England launched in December 1992, plans an infrastructure with:

- person-based information systems
- establishment of the NHS number as a unique person-identifier within all NHS systems
- a national thesaurus of coded clinical terms
- establishment of an NHS-wide network of voice, image, data and radio communications
- national standards for electronic communication and formats and codes
- a national policy and framework to ensure confidentiality and security of person-based information, including contracting
- support programmes for training, education and development.

8.16 Further opportunities might include systems and databases which collect and analyse information to support the diagnosis and management of disease; bioprocessing and modelling systems which aid the rational design of therapies and interactive systems used for training and self-assessment. Information technology will undoubtably contribute to productivity gains but balanced against this are the costs and the need for training and access.

Artificial Intelligence and Expert Systems

8.17 Use of artificial intelligence (AI) techniques may increase as intelligent alarm systems, in planning treatments or in assisting physicians in routine clinical decision making. AI is limited in its use as a diagnostic tool by a lack of universal intelligence and an inability to deal with medical problems not encountered before. Medical decision making in the areas of rare disease, difficult differential diagnosis, or in the case of risky, expensive or new therapies needs human intelligence to combine the rational with humanitarian considerations. It seems likely that this kind of technology will not replace medical personnel, but may allow an increase in their cost-effectiveness and productivity.

RELATED ISSUES

8.18 We have also considered a number of issues related to the effects on the medical workforce of rapidly changing medical technology.

Training in New Technology

8.19 An important part of medical training and practice is to keep informed and discerning about new medical advances, adopting where appropriate, those of proven benefit. The introduction of any new technology into routine clinical practice should be controlled, evaluated and incorporated into a system of training and education. Technological advances have increased the trend to sub-specialisation in many disciplines and research, training and audit are essential activities in continuing good practice. Continuing medical education is a career long obligation for doctors and a requirement to undertake Continuing Medical Education with regular recertification is becoming obligatory for many specialties. We consider these activities are an absolute requirement to help prepare the current workforce to meet and adapt to future changes and recognise that suitable working time will be needed for them. The NHS cannot afford to allow any part of its workforce to become obsolete or inefficient.

Effect Of Medical Technology On The Consumer

8.20 Increasing health care consumerism and The Patients' Charter have increased patient's expectations of the health service and will increase demand for access to the benefits of new technology. Although some of these expectations may be unfounded or unrealistic, they do have resource implications. Conditions previously unrecognised or untreatable may emerge, with new populations of sufferers wanting treatment and counselling. Consumer priorities will need to be balanced against economies of scale. For example, the initiative to move more specialist care into the community and increase local services, could be limited by the supporting technology available for that care and physical, safety and cost constraints. With increasingly complex and severe disease, patients may need to travel further for gold standard clinical care in "high tech" centres.

Effect Of Medical Technology On Other Health Service Professionals

8.21 As skill mix evolves and tasks are performed by a variety of staff, training needs will increase. Despite the explosion in medical technology in some areas of the NHS and the increase in numbers of patients treated, there has been little sign so far of a change in the numbers of other health professionals employed (eg. the numbers of medical physics technicians or operating department assistants have not increased[4]). This may be a result of increases in productivity and/or underinvestment in technological capital in some parts of the service. In the established technological culture of the NHS, effective medical technology management should command priority - to provide corrective and preventive maintenance of the equipment and to ensure its quality and cost effectiveness. This may allow the medical profession to avoid becoming enslaved to technology at the expense of their more traditional skills.

Effect Of Medical Technology On Purchasers

8.22 Purchasers will want to identify those innovations that service their requirements, rather than those of great scientific interest. They will also want demonstrable effective outcome measures and value for money before they will be prepared to invest in new technology and there is a real danger that this will result in both a development and investment gap. Purchasers need a better understanding of research to inform policy development which is directed at the quality and effectiveness of health and social care[5].

Factors Affecting The Diffusion And Uptake Of New Technology

8.23 Several recent initiatives have belatedly set in place mechanisms necessary to describe health practice methods and to develop plans and methods for the critical assessment of their usefulness. The Technology Foresight Programme[6] and the Standing Group on Health Technology[7] emphasise the importance of health technology assessment. They will guide decisions on the future funding of research and developments and advise on new and existing technologies where, because of the potential risk, cost, ethical implications or other considerations, there is a particular need to control diffusion until more information is available. The Advisory Panels of the Standing Group aim to identify the initial and future technological/methodological priorities and will eventually consider all procedures used to promote health, to

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4 1985 to 1991

5 One example is a new initiative currently being evaluated by Oxford RHA and soon likely to be distributed nationally. Concise data on the clinical effectiveness of a wide range of treatments, diagnostic tests and services, produced in a monthly bulletin for the information of purchasers and GPs. The Bandolier. Available from Oxford RHA.

6 established following the white paper "Realising Our Potential" to identify generic technologies with the aim of bringing industry, the scientific community and government departments closer together.

7 convened by the Central Research and Development Committee in reponse to the report "Assessing the Effects of Health Technologies: principles, practices, proposals". DoH 1992

prevent and treat disease, and to provide rehabilitation, long-term and palliative care.

8.24 Information systems are also being established (eg. the Cochrane centre[8], effective health care bulletins[9], the Dissemination and Enquiry Unit[10]), which will promote the effective use and exchange of up-to-date information and research, between research institutions, industry and the NHS. Factors which may affect the subsequent development, adoption and dissemination of technological innovations in the NHS include:

- funding and the economic climate
- application to service requirements
- organisational change
- potential cost/benefit and effectiveness
- evaluation and communication of research
- successful adoption by opinion leaders
- time, cost and level of difficulty of further training

CONCLUSION

8.25 There are many influences on the future development and utilisation of medical technology and it is impossible to predict which of these will predominate or have most effect on the medical workforce. Despite the important and necessary influence of various advisory panels, purchasers, patients and managers on technological change, it is the doctor finally, who enlists the aid of technology in the clinical management of the patient. We think that this discriminating medical opinion should be nurtured, not bypassed, in the interests of a continued high standard of clinical care and cost effectiveness.

We consider that there are no indications at present that fewer medical personnel will be required to provide health care, as the diversity and extent of medical technology increases. The numbers practising in the different specialties will need to change to reflect the future priorities of the NHS. We consider that Continuing Medical Education, research and health technology assessment are essential to allow the medical workforce to be selective in their application of new technologies.

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8 Established in Oxford in 1992 with international collaboration, to assist specialists in a wide variety of fields to prepare, maintain and disseminate systematic, up-to-date reviews of randomised, controlled trials relating to health care. The NHS Centre for Research Reviews and Dissemination was opened in York in 1993. These facilities are designed to provide information not only for clinicians and managers, but also for policy formulation in the field of health care.

9 An experimental project for dissemination of scientifically credible, defensible and accessible information to key players in the NHS which will, through the purchasing function, increase the effectiveness and efficiency of healthcare.

10 Established in 1993 to focus on the systematic transfer of accessible and up-to-date overviews on R&D information to NHS managers and clinicians. It will also provide enquiry based access to the results of R&D.

9 CHANGING THE SKILL MIX

INTRODUCTION

9.1 We previously recommended that changes in the skill mix between different types of doctors and between doctors and other health care professionals, should be further considered and researched.

9.2 The pressures for change in the existing skill mix amongst health professionals are increasing. Our first report predicted a shortfall of doctors in the UK by 2010 and we note that there are already staffing problems in certain specialties. Current workforce policies, operating now in a radically new management climate are also forcing a fundamental review of medical staffing. There are to be still tighter controls on junior doctors' working hours and the implementation of the Calman Report will require additional medical time for training and supervision. Clinical care is becoming increasingly complex, so too are the clinical activities now undertaken by non-medical professionals. As a result of these various pressures and leaving aside the question of whether more doctors may be required in the future, it is clearly time for some changes in the structure and pattern of working arrangements in the health service, although the direction, extent and mechanisms of such changes are not certain.

9.3 We have looked at a number of new roles and ways of working which have been established recently. Little research has been done yet on the long-term problems or benefits associated with these schemes, although new research projects have begun to quantify and evaluate the effect of changing the skill mix on workforce requirements. There are significant difficulties in this work owing to the lack of comprehensive, valid or widely accepted measures of clinical outcome and quality. It is possible that significantly changing the skill mix in the health service could affect the extent of the required increase in the numbers of doctors.

WHAT IS SKILL MIX ?

9.4 As a concept skill mix is now widely appreciated although interpretations may differ. It has been explained as:

> "the balance between trained and untrained, qualified and unqualified, and supervisory and operative staff within a service area as well as between different staff groups."[1]

Optimum skill mix is achieved when the desired standard of service is provided at minimum cost, which is consistent with the efficient deployment of trained, qualified

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1 R Nessling, Manpower monograph number two - skill mix: a practical approach for health professionals. DOH/MPAG 1990

and supervisory personnel and the maximisation of contributions from all staff members. Provision of this optimum skill mix involves identifying the range of tasks and responsibilities involved in providing care within a particular area, the necessary level of skill required and the personnel who are most appropriate to perform such tasks.

9.5 Skill mix may relate to the medical workforce on several levels: intraprofessionally (which includes grade mix), interprofessionally (using medical, paramedical and ancillary staff in clinical areas) and in the balance of care between clinical areas (eg. primary and secondary care).

Intraprofessional skill mix

9.6 In the UK at present, medical grade mix, in common with that of other health professions such as nursing, is a normal consequence of distributing clinical workload according to the skills and experience of the staff looking after patients. However, when the number and mix of staff are reduced "out of hours", particularly in hospitals, it is not uncommon for some tasks to be taken on inappropriately. This may mean tasks are undertaken with inadequate knowledge, experience or training, but more commonly involves junior doctors in fairly routine and time-consuming tasks which could be performed by other staff. This has resulted in the misuse of expensive medical education and training, staff disillusionment, and on occasion led to an inadequate standard of service. Medical grade mix will be reduced with the implementation of the Calman Report and the move towards a more consultant-based service, as a greater proportion of clinical work will be done by career grade staff, with junior doctors spending more time in supervised and structured training.

9.7 Consultants have duties in addition to clinical work, most of which cannot be performed by other medical groups. These other tasks need to be taken account of in employment contracts which currently tend to address only clinical work. This will require an increase in career grade staff to maintain clinical services, but by focusing on what work is actually done, further areas of individual expertise could be developed and Trusts could recruit the most appropriate and effective individuals to major non-clinical areas of consultant work, such as teaching and management. Greater flexibility in career grade job plans is needed, reflecting and responding to the changes in commitments, abilities and interests which occur throughout a working lifetime. Together with greater mobility at consultant grade, this would expand the opportunities for changing the skill mix both within the medical profession and at the interface with other professions (eg. management). Further benefits might include an improvement in the maintenance of personal innovation and commitment over many years, with less likelihood of "burnout" at a senior level.

Interprofessional skill mix

9.8 A number of Trusts are developing new and diverse healthcare roles. These roles have frequently been established on an ad hoc basis, often to meet a local staffing need. Some have been running successfully for several years and are to continue and expand, others are less certain of a future. There has been proliferation and hybridization of the original schemes resulting from a growing awareness of their usefulness and success[2]. There are several overlapping categories in the development of new clinical roles: substitution of one professional group by another; extension or expansion of work already done by an established occupational group; and the evolution of new occupational groups with differing training backgrounds. A list of examples is at Appendix 10.

9.9 Many of the present schemes involve an extended role for nurses, the largest but by no means only professional group, which might change its working practices. Other groups - scientific staff, physiotherapists, technicians, medical secretaries, ward clerks - have the potential to expand their role. There is now widespread acceptance that many tasks which are currently performed by medical staff could be undertaken effectively by other professional groups. Whilst it is clearly undesirable to have highly trained and relatively expensive medical staff engaged on inappropriate tasks, changing the skill mix is also an opportunity to increase the scope, challenge and interest of other staff.

9.10 Various professions are looking at ways in which they might accommodate the changes in the health service within and around their own disciplines. For example, the Royal College of Radiologists recently advised its Fellows to re-examine the working relationships of physicians and other professionals working in clinical radiology and clinical oncology, outlining extended roles in a number of areas such as ultrasound scanning, intravenous injections, the organisation of clinical trials and research[3].

9.11 Following the expansion in primary care services, the number of practice nurses has greatly increased over the past 10 years[4]. Many practice nurses now run specific clinics (eg. asthma, diabetes, breast screening) and have a major role in health education. Specialised practice nurses can have a considerably extended role which varies with local needs, training, personalities and protocols. Other staff including midwives, health visitors, social workers and practice managers (whose numbers have increased by 41% since 1990) have taken on aspects of the traditional work of the GP, who in turn has taken on additional administrative and managerial tasks. For example, midwives may now be the lead professional, planning and

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2 "Non-medically qualified surgical assistants" Hallett J. British Journal of Hospital Medicine 51.1/2.8-10

3 Staffing and Standards in Departments of Clinical Oncology and Clinical Radiology - a discussion paper Royal College of Radiologists 1994.

4 Number of practice nurses 1982:1515, 1992:9640

providing care for uncomplicated pregnancies and deliveries[5].

The interface between primary and secondary care

9.12 The boundaries between traditional hospital and primary care are becoming more blurred. Priorities and Planning Guidance[6] for health authorities and GP fundholders stresses improvements in the quality of primary care services and care in the community, with purchasing decisions being taken closer to patients. There is a range of initiatives which are expanding the role of the primary care sector, one example of this is the increase in medical and surgical outreach clinics initiated by GPs. For several years some practice clinics have given patients the chance to see a specialist without having to go to hospital, with services ranging from community orientated specialties such as psychiatry and paediatrics to orthopaedics and general surgery. Since the introduction of GP fundholding, specialist care in the community has been taken even further. In some instances consultants (eg. in ophthalmology, dermatology) have direct responsibility to the primary care service. Other staff such as counsellors, physiotherapists and chiropodists are also being directly employed by GPs, to replace or extend hospital services.

9.13 GPs and hospital specialists are also forming closer links to promote shared care in other clinical areas. Some hospital services are being transferred to GPs or community services eg. outpatient clinics; chronic illnesses such as asthma, diabetes, hypertension and glaucoma are increasingly managed jointly between primary and secondary care. Some GPs are expanding the services they provide - these include minor surgery, ultrasound scanning, sigmoidoscopy and hearing aid provision according to their own specific interests and experience.

9.14 The Community Care reforms and the increase in day surgery both represent a widespread significant growth in activity in the primary care sector. There has also been an increase in prevention and health promotion activities, driven in part by central strategies including the Health of the Nation.

9.15 From the public's point of view there are obvious benefits from these services shifting into the community. The local clinics are popular and accessible and waiting lists reduced for some activities. There is also a general perception that the acceptability and appropriateness of services are improved when provided locally, and are more integrated with secondary care services.

9.16 The cost-effectiveness and resource implications of this shift towards primary care need further analysis. In the short-term much of the increased activity is an expansion of health care in the primary care sector rather than substitution by the primary care sector for secondary care services, where a parallel service continues to be provided. Although some reduction in hospital activity is implied by increases

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5 "Changing childbirth: the report of the Expert Maternity Group". London HMSO, August 1993. (Cumberlege report)

6 Priorities and Planning Guidance for the NHS. Currently EL(94)55 issued 22 July 1994

in day surgery for example, the decrease in activity may not be proportional to the increase in primary care activity. In the longer term the moves towards prevention and health promotion not only has no corresponding decrease in secondary care activity, but may increase it if unmet need is exposed.

9.17 Information on the cost-effectiveness and outcome measures of different treatment patterns will need to be balanced against the benefits to patients, as will the concerns of the medical profession regarding the lack of some facilities, support services and fewer opportunities for training junior doctors. There may also be a limit to the capacity of the primary care sector to absorb extra workload, not just for the individual GP (which may be partly offset by more flexible use of other members of the primary health care team), but by the funding arrangements, size of the potential patient market for each service and the space available.

Patient Focused Care

9.18 An alternative approach to providing patient care (although not mutually exclusive to other skill mix initiatives) has been piloted in five different hospitals and one Community Trust. Patient Focused (or Centered) Care (PFC) stimulates professional staff to rethink the way in which they plan, organise and deliver care. There is a team of carers, with tasks performed by the most competent, appropriate member of the team, rather than delegated by senior staff members. This team involves many health professionals and care is provided wherever possible at the bedside, according to the patients clinical circumstances.

9.19 As in all of these innovations, training has been a prerequisite for further skilling of personnel. PFC aims to provide a highly motivated workforce, a high quality service to patients which gives value for money and to create a working environment which attracts and retains talented staff from all professions. Two of the hospitals have been running in this way for the past two years and are currently being evaluated.

Overseas experience

9.20 Medical staffing problems are not unique to the UK and new roles for health care professionals are also evolving overseas, but examples already standard in practice in other countries (eg.France, Sweden, the Netherlands, Russia, the United States (USA) and Canada) include: physician assistants, nurse anaesthetists, respiratory therapists, nurse practitioners, paediatric nurse practitioners, emergency room technicians and ambulance paramedics.

9.21 Many of these roles are well established and accepted both by traditional health care workers and the public. Such "physician extenders" are said to have a useful role in providing efficient, cost effective and expedient high-quality care to patients for certain complaints and procedures. For example, American nurse practitioners (NPs) and physician assistants (PAs) play a major role in providing

healthcare particularly in under-doctored areas such as rural primary care. PAs working in the hospital sector relieve the residents (doctors in training) of some of their service responsibilities and allow them a good quality educational experience.

9.22 PAs are *dependent* practitioners, becoming experienced and skilled at a mid-level of health care, answerable to the attending physician but accountable for their own actions. The training and certification process emphasises the recognition of limitations and the need for consultation. There is no delegation of the medical role. Several American studies conclude that the quality of the medical service (that PAs are competent to provide) is equal to that provided by physicians. They also found patient perception is overwhelmingly positive, malpractice suits are rare and the cost is approximately 40% of the salary of a certified doctor. There are approximately 30,000 PAs nationwide in the USA (compared with about 630,000 doctors) and the same number of NPs (about 1.25% of all registered nurses). NPs are regarded as complementary but *independent* practitioners (although they are not independent in the practice of medically related functions), the role comprising a blend of advanced clinical practice, educational, research and administrative responsibilities.

9.23 The nature and structure of other health services are often, of course, quite dissimilar from our own. PAs are a normal and necessary part of American medical practice because there are a limited number of primary care generalist physicians with a gatekeeper role to a specialist secondary service. The funding of health care, the uneven distribution of qualified doctors predominantly to large urban centres and the high costs of "specialist" care, requires some other level of non-medical health care provision. It is the fact that the service can be provided in this way, safely and effectively, rather than the reasons it is necessary, which we find relevant to the skill mix debate.

FACTORS AFFECTING CHANGES TO THE SKILL MIX IN THE UK

9.24 Changing the skill mix in the NHS will involve issues which include redefining professional boundaries and autonomy, perceptions of deskilling, the potential fragmentation and disintegration of specialties, erosion of junior doctors' training and experience, continuity of care, sensitivities around "chore dumping" and accusations of cost cutting. These may require lengthy discussions, compromises and attitude adjustments amongst traditional professional groups, before new working practices can be successfully introduced. There are other issues which also need consideration:

Consequences for other staff

9.25 In a well-managed environment with appropriate skill mix, there should be a relatively equitable distribution of work. This may mean that as nurses, say, perform more of the traditionally medical tasks, another group, care assistants for example, take on some of the traditional nursing tasks. At present nurses, to whom tasks "inappropriate" for doctors are most commonly devolved, are concerned that

these tasks are *added* to their normal work and may be no more appropriate for nurses than doctors. Flexible duties of all staff groups, backed by appropriate training should allow more relevant task allocation.

Accountability

9.26 Where tasks are delegated to other health care professionals in clinical areas one area of concern is accountability. In the hospital sector of the NHS, all health care workers are indemnified by the employing authority. The problem of delegation from senior to junior doctor is as pertinent as doctor to nurse delegation - with respect to the competency to perform certain tasks - and underlines the importance of consultation. The nursing professions now follow the guidance in the United Kingdom Central Councils' (UKCC) "The Scope Of Professional Practice 1992" which emphasises *personal* accountability and responsibility. In general practice, GPs have a primary non-delegatable duty of care towards their patients (which may not be delegated) and are vicariously liable for tasks delegated to their employees. Practice nurses may be personally responsible in law for their mistakes, but in practice they are rarely sued.

9.27 Where additional tasks are taken on which are not part of basic or standard training there should be:

- delegation is in the interests of patient care (rather than cost effectiveness).
- clearly established accountability
- recognition by all that the task may be delegated
- specific and adequate training appropriate to the tasks
- training recognised and delegation agreed by employer
- delegatee understands and is prepared to undertake task
- delegator assured of individuals continuing competence
- delegation of task(s) is planned and audited

Legislation

9.28 If the role of the American styled physician assistant was to be instituted in the UK, their status to examine and treat patients would have to be legally recognised and changes to our prescribing legislation would be necessary. Limited nurse prescribing is now undergoing pilot studies in eight fundholding practices in the UK.

Local influences on the development of skill mix

9.29 Geography and local demography may influence the extent and direction of any skill mix changes. In areas where recruitment and/or retention of highly trained staff is difficult, there will need to be a greater reliance on other staff. The variations in local staffing needs possibly explain many of the differences in organisational will, capacity and capability to support skill mix developments.

9.30 The past system of national medical workforce planning and **remuneration** has given Britain an exceptionally low number of doctors per capita and ratio of doctors to other staff groups, whilst maintaining very high levels of productivity. Changing the skill mix and working practices within a Trust may promote local systems of remuneration for staff in future, possibly linked to productivity and agreed outcomes. Purchasers might be expected to force the issue by looking at both cost and quality assurances for their patients. However, robust, meaningful and feasible measures of clinical quality and outcome are unavailable and there is no evidence yet that different remuneration systems for hospital doctors affect their productivity.

9.31 The distribution of **independent hospitals** with their different staffing structure may also affect skill mix locally in the NHS, as they need to compete with Trusts for the services of highly trained and experienced staff. Once the Calman Report is fully implemented, a Certificate of Completion of Specialist Training (of UK or EC origin) may be the only necessary credential for doctors to work independently in the private sector.

Range and level of services

9.32 In the future it is likely that the range and level of services that are provided locally will be defined by GP fundholders, purchasing authorities and public health physicians. It will then be up to the providers in that area to organise those services appropriately to meet the recommended standards. This may mean the composition of the existing workforce will change, with some groups or individuals becoming surplus to local requirements and others being recruited. Highly sophisticated or expensive advances in medical technology and treatment, may concentrate some services into specialised, supra-regional centres which attract patients from a wide, even national, catchment area. Alternatively there are other clinical developments which now allow the dissemination to local centres, of high technology treatments previously only available in super-regional centres (eg. Transport In Vitro Fertilisation). The balance and type of health personnel and their associated skills, will be a function of the range and level of healthcare provided at a particular site.

Costs

9.33 There will be initial development and possibly longer term service costs, to train and maintain staff in new or additional skills. Whilst natural developments will occur, as with practice nurses, at present there is no central mechanism to facilitate, support or disseminate any of the existing successful skill mix schemes which might already be regarded as good practice. There is no recognised standard training or competency assessment for new or extended roles. A more coordinated or structured approach to changing the skill mix could reduce initial costs, and provide some external validation of the additional training and experience gained by individuals undertaking these new roles.

9.34 Alternative health care workers (doing "junior doctors' work") are not cheaper than junior doctors. Where such workers are employed there has not yet

been a reduction in the numbers of junior doctors required, or even sometimes in the hours they have worked. However, there is often a reduction in work intensity and fatigue amongst the juniors, if not in their stress levels. This is hardly surprising as many of the schemes so far have been established in response to a pre-existing service deficiency and involved only one or two new postholders. The main benefit in employing staff in these new roles appears to be an improvement in patient satisfaction, in the standard of patient care and possibly the productivity of a unit. This is an area of skill mix research which greatly needs more substantive data.

Changes in medical education

9.35 Medical education is currently under review in the UK, as in many other countries. Government proposals for funding medical and non-medical education and training, are designed explicitly to give scope for innovation in mutidisciplinary training at a local level. The World Health Organisation recommends that educational institutions evaluate both their educational programmes and graduates, with respect to their impact on and contribution to, solving priority health problems[7]. In the future the education and training of the medical workforce may change further, becoming more integrated with that of other health professionals and providing the flexibility to meet consumer needs and the realities of health service delivery.

CONCLUSION

9.36 Skill mix appears to be an essential mechanism to help manage changes of the scale and complexity currently underway in the NHS. We suggest that skill mix changes are a means of augmenting the efforts of the existing medical workforce, without which maintainance of services to patients would be difficult. We consider purchasers and Trusts must take responsibility for developing and supporting further changes to the skill mix, which reflect their own local needs and priorities for services, to improve the overall quality of patient care and the morale and efficiency of the workforce.

9.37 As with other issues considered in this report, the consequences of changing the skill mix on the future requirement for doctors are not clearcut. At present we cannot judge the future need for doctors should there be widespread substitution of significant tranches of medical work by other health professionals. We do not know the acceptability of such a move to patients, purchasers and the professions involved. We do not know the extent to which substitution is feasible in terms of standards of care, costs, training requirements and recruitment into the various professions. As medical knowledge and technology expands we can be sure that more medical work will be identified and health care demand will continue to grow. There is no evidence so far to suggest that skill mix changes at the current level will affect the required increase in the number of doctors we need to train for the future, although

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7 WHO report no. 838 "Increasing the relevance of education for health professionals"

we do expect that skill mix changes will have a significant impact on the delivery of health care. Research projects on aspects of skill mix have recently been commissioned but more are needed and we intend to regularly review the evidence from such work. We consider that the Health Departments should give priority to research investigating the costs, benefits and consequences of different patterns of substitution.

RECOMMENDATIONS

We *recommend* that skill mix changes are promoted where they may benefit staff and patients; and that new initiatives should be carefully evaluated, particularly with respect to patient outcomes and efficiency gains. Results and conclusions from such evaluations should be shared and discussed to enable the development of good practice guidance.

We *recommend* that a central database on the development and evaluation of new roles, innovations and practices be established; and that information from this be made available for the advice and guidance of purchasers and providers wishing to alter local staffing arrangements to support cost-effective, high quality health care provision.

10 WORKLOAD

INTRODUCTION

10.1 Evidence presented to MMSAC over the past two years has frequently stressed the increasing workload of doctors, especially the expanding range of non-clinical activities. Most of this evidence has been anecdotal as there is little information about the range and extent of these additional activities which continue to evolve. We are interested in doctors' activities which are *additional* to their existing workloads, are *not clinically based* but are *essential* to the effective delivery of health care in the NHS now and in the future. Whether such activities would continue to represent a burden in the long term, if they promote effective service delivery (management tasks), identify effective treatments (medical audit) or contribute to the quality of the next generation of doctors (teaching and training), is difficult to predict.

10.2 What is clear is that the process of change in the NHS is rapid and ongoing and the medical workforce must be managed effectively. Constantly adding to the duties of the existing doctors is not a long-term solution. Given that health care demand is unlikely to diminish, it follows that the NHS workforce must change its composition, the allocation of its duties or its size.

RANGE OF EXTRA-CLINICAL ACTIVITIES

10.3 Until recently job descriptions were often very general but consultant contracts are now subject to job plans (as outlined in circular HC(90)16 and WHC(90)42 for Wales and NHS circular 1990(PCS)23 in Scotland) and expected to be more explicit, specifying what duties, including management duties, the consultant is contracted to do. They are reviewed annually and enable validation and evaluation of doctors' activities. Although non-clinical activities should be recognised in job plans, it is possible that in future contracts to provide a service will be made with clinical teams, which could allow greater flexibility for individual team members and accommodate specific interests and skills.

10.4 The range of non-clinical duties which has been increasing in the last ten years and especially since the reforms, now includes:

10.4.1 New activities:

- involvement in negotiations with purchasers
- monitoring of contracts
- local negotiations on terms and conditions of service
- clinical and medical directorships

10.4.2 Activities with increasing demand:

- medical audit
- complaints and litigation

10.4.3 Ongoing activities:

- teaching and training
- continuing medical education
- academic activity and research
- national duties

Involvement in Negotiations with Purchasers and Monitoring of Contracts

10.5 The Government wants doctors to be involved in the contracting process in order to develop services and achieve health gain objectives which managers are not competent to do alone. Realism in contracts and resulting benefits, can be achieved only if they take into account doctors' views on clinical need and practice, workload planning and medical developments. The commitment of doctors is also required to develop the necessary guidelines for regulating activity and accessing clinical audit.

Directorships

10.6 Early anecdotal evidence indicated that a medical director of a medium-sized Trust spent 5-6 sessions per week on management tasks whilst continuing with clinical duties, although increasingly appointments are becoming full-time. There is provision for dealing with additional management responsibilities by contracting for up to two additional notional half days (ANHDs) for management work or one ANHD where some clinical duties are covered.

10.7 Clinical directors are usually consultants with full-time clinical practices. Their management input may be compensated for by additional payments, increase in annual leave or increase in secretarial and administrative support. Evidence indicates that most clinical directors are reluctant or unable to reduce their clinical workloads and management tasks are fitted in around their other commitments.

Medical Audit

10.8 There is increasing participation by doctors at all grades as medical audit arrangements are established and refined. The examination of the effect of treatments and interventions on mortality and morbidity is not new, it is the organisation of audit which has changed with regular formal meetings and the participation of all medical staff.

Complaints and Litigation

10.9 There has been an increase in complaints from patients partly as a result of The Patients Charter. The number of complaints reported to the GMC has increased by 48% since 1990/91 to 1,615 in 1992/93 and complaints to the Health Service Commissioner (Ombudsman) rose to a record level of 1227 in 1992/3, with the proportion of complaints accepted for investigation also increasing. "Being

Heard" the report of the Wilson Committee[1], which reviewed NHS complaints procedures has recommended a series of broad principles for complaints handling and detailed features of effective complaints procedures.

Teaching and Supervision of Training

10.10 Implementation of the Calman Report will provide a more intensive and structured training for junior doctors and may require some consultants to spend more of their time on teaching and supervision of training. It is possible that some individuals and possibly whole Trusts, might in future opt out of training junior doctors altogether. The net effect on consultants clinical time will not be clear for some years.

Continuing Professional Development

10.11 Continuing medical education for all career grade doctors is becoming more formal and obligatory, with credit systems and recertification established in growing numbers of specialties. Non-clinical roles of manager, teacher and advisor are also now recognised as requiring formal and additional training as part of continuing professional development (CPD).

QUANTIFYING NON-CLINICAL WORKLOAD

Primary Care

10.12 General medical practitioners have always had a significant management role associated with their status as independent contractors. The development of primary health care teams has required more coordination and management, but also provided opportunities for delegation of some clinical and non-clinical tasks. This complicates comparisons of current with historic activity, in efforts to identify new or additional non-clinical work.

10.13 There are varying estimates of the time spent on management in general practice, depending on the seniority of the partner and the time of the year. A General Practitioner workload survey has just been completed, addressing both clinical and non-clinical activity amongst fundholders and non-fundholders. The survey was conducted jointly between the General Medical Services Committee (GMSC) and the Department of Health and is the third such survey, but the first since the new GP contract and the advent of fundholding. An interim report was presented to the Doctors and Dentists Review Body (DDRB) in October 1993 and the final report is due in early 1995.

10.14 The survey included a diary kept for one week, with one section specifically aimed at obtaining data on practice administration, including:

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[1] Being Heard: The report of a Review Committee on NHS Complaints Procedures. 1994

"management of staff, financial matters, accommodation, preparation of duty rotas, annual reports, business plans etc. This [section] does not include audit or dispensing duties." Other sections provide data on purchasing, some other professional activity (non-General Medical Services) and medical audit.

10.15 The findings of the interim report, based on the first seven months of data and using 1,073 fully validated questionnaires, showed there had been an increase in the number of GMS hours worked by the average GP since the introduction of the new GP contract in 1990. It also indicated that practice administration, which in 1989/90 accounted for about 2.5 hours out of the 37 hours/week spent on GMS, had increased significantly, although still forming only a small proportion of total GMS time. Non-clinical activities included in the survey now account for approximately 20% of the time spent on GMS. Results also reveal that in general, the more practice staff employed by the practice, the greater the number of GMS hours worked by the GP.

Secondary Care

10.16 There are no studies on workload of comparative size and rigour in the hospital sector. The Hospital Consultants and Specialists Association (HCSA) conducted a small survey (275 responses) in 1992/3 of the amount of time spent by members on purely management activities. The results (excluding time spent on teaching and audit) are given in Table 10.1.

Time spent as:	No of responses	Total no of hours	Average no of hours/week
Chairman of Department	73	320	4.36
Clinical Director	93	633	6.80
Committees Management	120	417	3.47
Departmental Management	265	624	2.35

Table 10.1 Time Spent on Management Activities

10.17 A 1992 survey of clinical directors who were members of the British Association of Medical Managers (BAMM), showed that the role of clinical director was still at an evolutionary stage. Of those who responded, 40% committed 2 sessions a week to management and 21% one session per week. 60% had received some training for their management role, but 90% felt that they needed further management training.

10.18 In order to lend some substance to this minimal information and anecdote,

we asked consultants about their workload ourselves[2]. One hundred anonymised consultants working in a variety of hospitals in two regions, in 29 specialties (Appendix 11), were asked to complete a questionnaire detailing their clinical and non-clinical activities. There were 71 responses.

10.19 Consultants were asked for the amount of time they spent each week on average, on teaching (as a seperate activity), audit, hospital management/administration, unit/directorate management, research and other activities (eg. interviews) now, one year ago, and five years ago (where applicable). The mean hours per week and the range for each activity are given in Table 10.2.

ACTIVITY hrs/wk	1994	1993	1989
TEACHING mean (range)	3.13 (0-10.5)	2.85 (0-12)	3.18 (0-15)
AUDIT mean (range)	1.32 (0-6)	1.2 (0-8)	0.38 (0-3)
HOSPITAL Mx mean (range)	5.99 (0-25)	4.62 (0-20)	2.1 (0-15)
UNIT Mx/ADMIN mean (range)	4.72 (0-16)	3.45 (0-15)	2.0 (0-15)
RESEARCH mean (range)	1.36 (0-7)	1.81 (0-10)	2.26 (0-12)
OTHER mean (range)	3.65 (0-20)	2.23 (0-12)	1.5 (0-7)
TOTAL	**20.2**	**16.3**	**11.5**

Table 10.2 Changes in Consultant Activity 1989 - 1994

10.20 In addition to these activities, the time spent on personal continuing medical education/continuing professional development was an average of one day per month (range 0-4 days) equivalent to 2 hours per week. The time spent on **professional business** (eg. giving lectures, expert witness, college business) was an average of 2.6 days per month (range 0-15 days) equivalent to 5 hours per week.

10.21 Virtually all consultants sat on several local and/or national **committees** (average 5.8 with a range of 0-17). Depending on the nature of the committee, meetings lasting 2-3 hours often in the evenings, occurred on average 25 times per year; equivalent to 1.2 hours per week. The average time spent in private practice was 5.5 hours per week (range 0-18), the great majority of this being at evenings

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2 MMSAC, aided by two members of the Regional Medical Manpower and Personnel Group (Northern and Oxford regions)

and weekends.

10.22 Most (96.8%) consultants felt their jobs had changed since they had been appointed (74% had been appointed since 1981). 85% stated that there is now much more administrative and committee work, 33% felt there was a much greater patient load, 10.6% no longer had time for research (the figures in the table include responses from a number of academic post-holders). A significant number (41.6%) wanted to renegotiate their contracts and 11% wanted to go part-time. 69% wanted more formal contractual arrangements for their non-clinical activities.

10.23 This was obviously a small sample, but one which we think was reasonably representative. An average consultant is apparently working over 35 committed clinical hours a week and over 20 hours a week on non-clinical tasks. Many of the respondents enjoyed their new responsibilities, but many also commented that they had trained to be doctors, not managers or administrators. There was some evidence that the burden of this workload does not fall evenly between consultants, a finding which has been highlighted in the Audit Commission's report on Hospital Medical Staffing[3].

10.24 Consultants' practices vary greatly with different levels of commitment to clinical and non-clinical work. Doctors' interests, abilities and commitments in aspects of their work will often vary throughout their working lifetime, but the current system allows little flexibility to focus their efforts most productively. There is a clear need for continuing professional development and an improvement in the current management arrangements. Much of the reported dissatisfaction, stress and low morale of some consultants appears to stem from the increase in management and administrative tasks, which has not been associated with a concomitant reduction in clinical workload, nor confined to those clinicians most able and willing to take them on. The facility to change the emphasis or remit of a career post depending on the needs of the individual and their organisation, would be a sensible mechanism to help manage this expensive and productive cohort of the NHS workforce.

10.25 There are other factors which may also be contributing to the disquiet of both consultants and GPs, such as the emphasis on expanding primary care services, the increasing power of purchasers and GP fund holders, the Patient's Charter with its associated priorities and demands for accountability and the changes to the training and working conditions of junior doctors. There will not be one national solution to the problems in the NHS resulting from the recent changes and nor will it involve only doctors. Changes in the composition and skill mix of the NHS workforce are options which are currently being pursued in some areas of the health service and are part of a solution in which work is distributed amongst an adequate number of staff to whom such work is appropriate.

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[3] Hospital Medical Staffing. National Report. Audit Commission March 1995

CONCLUSION

10.26 There is no doubt that doctors are now expected to play a much more corporate role in their organisations and that demands on their time have increased in a number of areas. These demands must be properly recognised if clinical work is not to suffer and medical staff become overloaded. Doctors need to be deployed efficiently to meet demand. This will mean prioritising roles, clearly defining what is expected in that role and monitoring what is actually done.

10.27 It is important that individual clinicians have the facility to respond to the new challenges presented to them. Opportunities for continuing professional development are essential, if individuals are to manage effectively not only their own careers, but the delivery of a high quality clinical service. The success of the continuing changes in the health service depends on the cooperation and commitment of both management and health professionals working together.

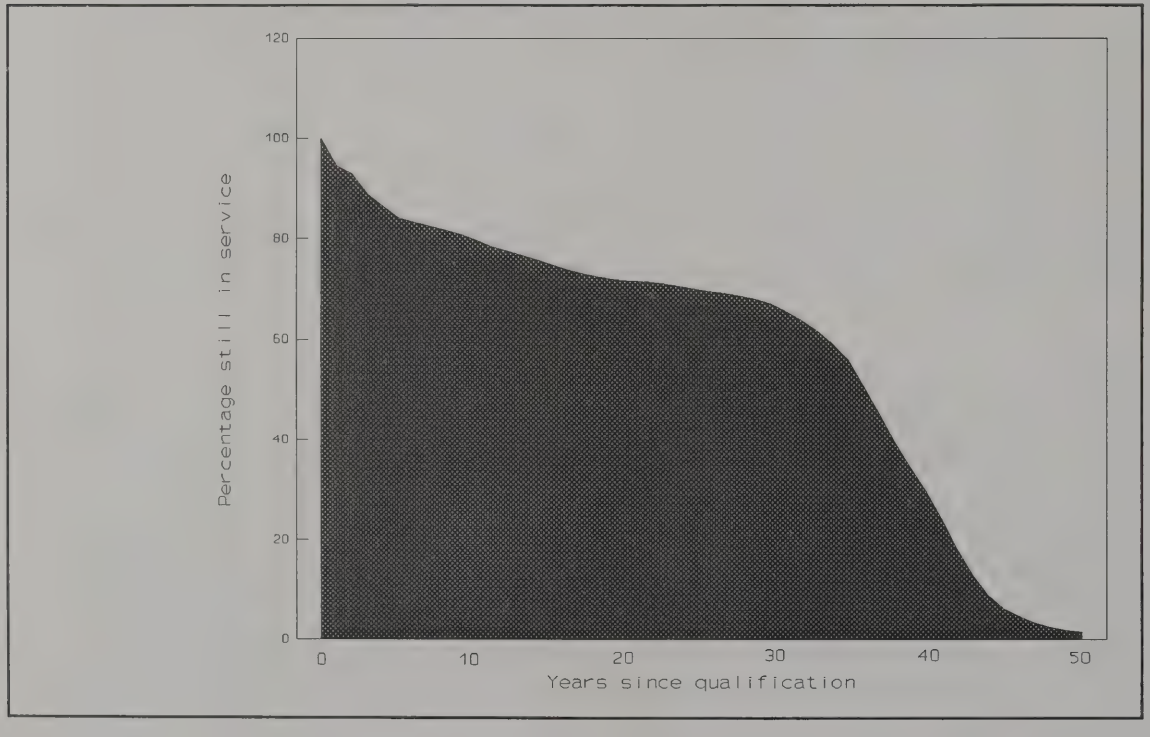
11 MAXIMISING POTENTIAL

INTRODUCTION

11.1 In order to plan the future medical workforce, it is important to know about the employment patterns of doctors trained in the UK. We have stated previously that if doctors are not working in the NHS or even in medicine, we should know the numbers involved, their reasons for leaving, the nature of their alternative employment and the likely future trends.

11.2 Disaffection with medicine as a career may become a problem at any stage but significant "wastage" most commonly occurs at medical school, in the first few years after qualification and towards the end of a career (Chart 11.1). The word wastage as we use it here, is a technical term commonly used in mathematical modelling to represent people (or things) leaving a defined area or state. In this case, it means doctors who cease, temporarily or permanently, to work in the NHS/University sector in the UK. As a technical term, it makes no distinction between different classes of leaving (emigration, retirement, career-break, etc) and certainly implies no value judgement.

CHART 11.1: Percentage of doctors still in service each year after qualifying - "central" (Parkhouse-based) assumptions



11.3 We are keen to address the factors which affect wastage and to consider mechanisms that may minimise it in future, within a system which allows all those that embark on a medical career to maximise their potential. We feel strongly that doctors leaving the profession prematurely not only represent a huge loss of investment in their education and training but a disappointing and potentially avoidable loss of an important human resource.

MEDICAL STUDENTS

Selection

11.4 The drop out rate for medical students has remained steady at around 10% for many years, the peak period being at the end of the second year. Medical students are often selected for a university place on the basis of exam results alone[1]. There is little doubt that some of these early leavers whilst academically able, find themselves quite unsuited to a career in medicine. Isobel Allen's last report[2] showed how little prospective medical students understood about what they were undertaking, either in terms of workload as a student, or about what "being a doctor" actually entailed. They may have entered medical school because they were good at science, subjected to family pressure, or were unaware of alternative careers, rather than because they actually wanted to become doctors.

11.5 Interviews for medical school places are becoming more common again, as the importance for potential doctors of other qualities such as compassion, communication skills and common sense are acknowledged. Many medical schools now also actively encourage school leavers to take a year out between school and university - a time for reflection, maturity and a wider experience of life presumably better preparing these students for their long and arduous training. There is evidence from one medical school that mature (over 21 years old) students are less likely to drop out of medical school than school leavers. The paucity of good quality careers advice and counselling at school and medical school, has again been identified by Allen in "Doctors and their Careers: A New Generation"[3], as a significant factor in some of the problems experienced by students during their medical training.

Medical Undergraduate Education

11.6 A revised curriculum framework document published by the GMC in

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1 McManus IC, Richards P, Selection of British Medical Students

2 Doctors and their Careers. (Allen 1988)

3 Doctors and their Careers: A New Generation (Allen 1994)

December 1993[4] set out new guidelines for the undergraduate medical course. These aim to reduce curriculum overload by moving to a core curriculum to be covered by all students, accompanied by special study modules which will allow students to further their knowledge in areas of interest to them. Integrated courses allowing early clinical contact are encouraged, as is the merging of traditional subjects and disciplines, towards systems based teaching and problem oriented learning. Some schools were already well on the way to an integrated course with a core curriculum and elective modules. This approach should improve the whole undergraduate experience and ease lateral movement into associated disciplines, for those students who realise that a medical career is not for them.

11.7 An option currently being pursued in Australia which could also increase career path flexibility, is medicine as a postgraduate course which follows a first degree in science. The Australian model has a four year postgraduate course, although in the UK the EC Directive 93/16 requires that basic medical training (degree course plus a Pre-Registration House Officer year) must be either 6 years or 5500 hours in duration. This idea could be extended further to provide a basic medical sciences degree for all health care professionals to which could be added modules for medicine, nursing, biochemistry, pharmacy etc.

11.8 The Council of Europe has recently recommended multiprofessional education of health personnel[5]. The recommendation covers basic (undergraduate), postgraduate and continuing education and includes guidelines on implementation. Strategies to overcome the perceived difficulties in promoting, implementing and maintaining multi-professional education in the UK have been devised[6] and several initiatives are in train[7,8].

POSTGRADUATE TRAINING

11.9 Although the numbers of doctors leaving medicine as a profession appear to be very small, up to one fifth of any given cohort of doctors may not be working in the NHS five years after qualification. Many of these doctors will be temporarily

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4 Tomorrow's Doctors: Recommendations on undergraduate Medical Education. GMC December 1993

5 Restricted CM(93)171 September 1993.

6 Multiprofessional Education: European Network for the Development of Multiprofessional Education in Health Sciences (EMPE) : Dr Rita Goble, Institute of General Practice, University of Exeter and Secretary General of EMPE. Journal of Interprofessional care, Vol.1 1994

7 Multiprofessional Education at the Postgraduate Medical School, University of Exeter. Pereira Gray D, Goble R. Openshaw S,et al. Annals of Community Oriented Education 1993. Vol 6 181-190.

8 Multiprofessional sessions have been introduced within a combined faculty of medicine health and biological sciences. A Masters in health professional education is open to those engaged in the education of health care professionals.

abroad, on career break or in alternative medical employment. The majority of doctors working outside the NHS are in the armed forces, the pharmaceutical industry, occupational health, civil, public and charitable services, industry or wholly in private medical practice. Many of these doctors will appear in our "wastage" figures despite obviously not being lost to medicine. They are making legitimate and productive use of their medical education and our remit is to advise on the total number of doctors needed in the UK, which clearly includes such other employments as well as the NHS. One of our difficulties is that statistical information is only collected from the NHS and Universities.

11.10 Many doctors who have left the NHS rejoin after a period of time (returning from abroad, secondment, child-rearing etc), with flows into and out of the out-of-NHS pool in a relatively steady state, although there is no point in the career structure where the numbers of returners exceeds the number of leavers. The activity rates (the proportion of the total medical workforce actually active in medicine) and participation rates (the ratio of WTEs to numbers in posts) of NHS doctors are high, indicating that most doctors are working in the NHS, the majority of them full-time (Table 2.1). However the figures conceal the underused potential of many of these doctors - the current (1993) proportion of female consultants is 17%, the proportion of female unrestricted principals in general practice is 26%. Thus for example, although the participation rate of hospital female doctors is 93.9% (compared with 95.3% for males), most of these doctors are in sub-consultant grades. The medical school intake has been 50% women since 1991. It will take time for the 50/50 cohort to progress to career grades.

11.11 Career paths in the UK are often considered by doctors to be conservative, inflexible, arduous, uninnovative and personally constraining. The average age at which the consultant grade is achieved is 36 years, taking an average of 12 years from qualification to consultant appointment. Many women find it particularly difficult to progress their careers during the child-bearing years and it is disappointing to note in Allen's latest report, that little has changed in this respect since 1986.

11.12 The NHS is the only structure in the UK in which a doctor can train and once a career grade is reached is still the predominant organisation in which to develop and expand the practice of medicine. More restrictive immigration policies abroad have reduced the opportunities for permanent emigration of UK doctors in the past 15 years, although movement of CCST certified doctors within the EC is increasing. Once several years have been invested in a medical career there are significant constraints on potential leavers, the "failure-tag" is a very real fear and there is widespread ignorance of possible alternative careers.

11.13 Increasing the number of part-time posts in both the training and career grades, combined with a shorter and more structured training period may help to reduce the loss of men and women from the medical workforce in general and the NHS in particular. The reduction in junior doctors' hours of work and improvement in resident doctors' living conditions should substantially improve the exhaustion and stress of the training years. Trusts may have more responsibility for the training

of doctors (possibly linked to service requirements) and consider provision of flexible working arrangements, childcare, stress counselling and exercise facilities for all staff as a means of increasing morale, productivity and the retention of high quality staff.

CAREER GRADES

11.14 Once established at a career grade the numbers leaving the NHS level off and remain relatively flat until the later years when sizeable numbers of doctors retire. Numbers of doctors taking early retirement have been rising steadily for several years. Complaints of stress, job dissatisfaction and low morale have become more vociferous in the past two years, with factors blamed including increased paper work, unrealistic patient expectations, increased business role, NHS cutbacks, lower standards of care, and management failure. There is a general dissatisfaction among GPs for similar reasons.

11.15 The increasing demands for a wider professional role with non-clinical tasks competing with clinical care, may persuade some doctors to abandon the NHS for a clearer clinical role in the independent sector, or to leave the turbulent health service altogether. Some of these concerns have already warranted action, for example GP's 24 hour commitment and the misuse of out-of-hours services have recently been reviewed, resulting in a change in the terms and conditions of service and greater discretion in how GPs provide this service. An Efficiency Scrutiny into Bureaucracy in General Practice was announced on 20 December 1994. It has the aim of identifying reductions that could be made in the administrative burden associated with the work of general practice.

11.16 The independent health care sector provides the major competition for career grade staff outside the NHS. Many doctors at consultant grade work in both the NHS and private practice, but it is important to be aware of trends as an expanding independent sector could have a significant impact on medical workforce planning. It is questionable whether the private sector can continue to be sustained by an essentially part-time workforce, as consultants have to fit private work around NHS contracted hours. Many consultants consider that they are meeting *extra* health care demand, that could not be met within the same timescale or existing resources of the NHS. Alternatively private hospitals may in future employ salaried specialists, for example post-CCST doctors in "the gap", or consultants made redundant in the rationalisation of urban hospital services, or contract with groups of consultants to do GP fundholder work.

11.17 Given that the resources of the NHS are finite, not all of patients' increasing expectations can be met within the public sector. There are some services (eg. health screening, fertility control, cosmetic surgery) which are of very low priority in the NHS and provision does not adequately meet demand. Purchasers may change the focus of referrals away from consultants to private hospitals with which they have contracts. Fundholding GPs attempting to use their budgets more effectively may refer insured patients to the independent sector, rather than purchase services

for patients from the NHS. Currently the private sector already accounts for approximately 18.8% of health care expenditure[9] (compared with 7.5% in 1984) and provides 20-25% of all elective surgery. The value of the private acute health care market rose 15% from 1990-1991 and 6% from 1991-1992. That percentage is expected to continue to rise with a concomitant requirement for a larger medical workforce.

11.18 Other factors may reduce the opportunity or demand for doctors to work outside the NHS. Some practitioners are disinclined to take on the substantial additional responsibilities of running a private business and some (non-consultant staff) have hitherto been unable to, although that may well change with the introduction of the CCST. The potential for private practice also varies with specialty, there may be little demand (eg. paediatrics) or inadequate capital intensive facilities available (eg. radiology and radiotherapy). The General Medical Council's (GMC) restrictions on doctors advertising their services, the economic recession, escalating costs of private health care, insurance policy exclusions and an increase in the supply of NHS pay beds with competitive amenities are all additional factors reducing the opportunities and demand for private medicine.

11.19 Wastage rates in previous supply forecasts for MMSAC have been based on the evidence from the Parkhouse studies, 1974 and 1977 cohorts. To enable us to plan future manpower requirements we must know what is happening now to our medical graduates and why. We are especially interested in the impact of the changes in the health service on the career movements of doctors; the effect of alternative patterns of working (skill mix, fixed term contracts, increased part-time working); Calman "graduates"; the rationalisation of clinical services in large connurbations, particularly London; junior doctor's shorter working hours, the shift from secondary to primary care and the mutual recognition of the CCST between member states of the EC. The new work from the Unit of Health Care Epidemiology on the Cohort Studies of Doctor's Careers will give us the best qualitative and quantitative evidence supplied for several years on the trends in doctors career moves, providing us with data on the numbers of doctors working outside the NHS and their reasons for doing so. This information is essential and we await the first results next year with interest.

CONCLUSION

11.20 Our medical workforce is recruited from among the most highly qualified school leavers - they undergo an expensive medical education and fulfill a key position in the nations health service. This makes the medical workforce a very valuable commodity deserving a high level of care at all stages.

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9 Laing's Review of Private Health Care 1993

11.21 The Committee is concerned at reports of doctors being dissatisfied with a career in medicine and in the NHS in particular. It is important that these reports are researched and the extent and rate of any resulting drop out quantified and monitored. We consider that Universities should have regard to the long term retention of doctors in the NHS when setting out criteria for student selection and undergraduate curricula design. We also urge all providers of health care to consider options for retaining or re-recruiting leavers from the NHS and the medical profession.

12 THE "AFFORDABILITY" STUDY

INTRODUCTION

12.1 One of the recommendations in our first report was that research should be commissioned to "examine the cost implications of a range of marginal increases in manpower, taking account of potential developments and changes in the way health services are provided and managed, and establish the strength of links or interactions between overall health expenditure and growth in medical manpower". Pannell Kerr Forster Associates were commissioned to carry out the work in conjunction with London Economics and Universal Health Consultants.

12.2 Work began in September 1993 to develop scenarios of the future use of medical staffing and to assess their affordability from a demand-led perspective. In this chapter we describe the design and construction of the model used in the study and the data and assumptions used in the model. We wanted the study to separate the demand for health care from any resource constraints. This was not to underestimate the importance of resource constraints, but to make explicit that the decision on the allocation of resources to the NHS will itself be influenced by the demands and expectations of the population and the costs of the services.

12.3 We were aware that this pioneering study would be difficult and it quickly became apparent that the complexity of the task would require more work than the limited timescale for this report. At the end of this chapter, we outline the further work that is needed. Although we have not been able to use the results in this report, we wanted to introduce this innovative approach to a wider audience. We would welcome comments on the study, particularly on its methodology and on the realism of the assumptions used in the scenarios. We would also like to thank the many different health practitioners, managers and organisations who contributed in the early stages.

METHODOLOGY

12.4 The project was designed to produce and model scenarios of health care demand and medical workforce usage over a twenty year period. Because of the potential range of developments in society, three possible scenarios for the future of health care and three for workforce planning were produced and agreed with us. Briefly these were a central scenario assuming the continuation of current trends, one with reduced growth (eg. in funding of the NHS, numbers of doctors), and the third assuming increased growth. Details of the scenarios are at Appendix 12 - Annex II.

12.5 The study and the model building were based upon a series of defined variables and assumptions, a number of which concerned epidemiological and population trends, which will affect the amount of health care demanded in the future. An underlying assumption of the study is that, other things being equal,

there will be an increasing demand for health care as the population grows, age profile changes and society's expectation for health care increases. Other factors may then affect how this demand for health care is satisfied. The diagram in Appendix 12 - Annex 1 indictates how the various factors inter-relate.

12.6 The medical workforce demand and the associated costs (salary and total health services) were determined using related workforce planning scenarios. A further exercise generated assumptions about the amount of money that would be available for NHS spending in twenty years' time. This involved producing a gross domestic product (GDP) growth trend, assessing what proportion of GDP health would be likely to consume, and producing the likely spend, within faster and slower growth scenarios.

12.7 Finally, the affordability of the workforce scenarios was assessed by comparing the cost of the scenarios to the likely level of resources available to the NHS, and the private health care sector in twenty years' time.

12.8 The data inputs are discussed in Appendix 12 - Annex IV.

THE ASSUMPTIONS

12.9 A concern with this work has been in the acceptability of some of the assumptions used in the modelling of the scenarios. Where reliable data was lacking, reliance was placed on reasoned assumptions and informed proxies.

- With respect to the **demand for health services** these assumptions were about: population, demand for health care and change factors in this demand, change factors in the demand for doctors, costs and private practice.

- With respect to the development of the possible **scenarios for the growth of health services** assumptions were made about: the underlying trend in demand and the changes therein, the demand growth in the private sector, contracted health care, length of hospital stay, day cases, bed occupancy rate, the percentage of GDP spent on health, the proportion of care in the private sector, the balance and form of service provision.

- With respect to the development of the possible **scenarios for workforce planning** these assumptions included: allocation of medical time, medical staff productivity, scope for substitution, quality, private sector demand for doctors, junior doctors' hours and quotas, effect of medical technology, gender composition of workforce, role and number of community health service doctors and those employed outside the NHS.

12.10 The assumptions were informed by a variety of **sources**:

- A questionnaire survey of leading medical organisations and individuals, asking opinions about the future of healthcare;

- Two focus groups, one held in Scotland, one in Northern Ireland, which sought specifically to highlight differences between England and the other countries in the UK;

- A literature search covering health services, epidemiology, health technology, the demand for doctors, women doctors, workforce supply, substitution, medical workforce terms and conditions, doctors' training and education, NHS management, productivity, international health care; and

- Informed opinion provided by the project team.

A full list of all assumptions and their sources are given in Appendix 12 - Annex III.

Our concerns with some of the assumptions

12.11 A combination of existing activity and morbidity data was used as a proxy for the expressed demand for health care. There are problems with such a proxy. Activity is constrained by the supply of services, which are constrained by the resources available. A better option for estimating demand, albeit with doubtful feasibility, might have been to examine prevalence and incidence of disease which would benefit from health care intervention (including palliative care).

12.12 The study and the model assumed that the underlying trend in variables would continue ad infinitum, unless it was possible to make explicit alternative assumptions. These variables included medical development, health screening, health care expectations and socio-economic characteristics. The trend is based on growth in health care activity in the UK over the last ten years and was calculated separately for in-patient episodes, out-patient attendances and GP consultations. There was thus potential for double counting if additional variables were used, which may have been already influencing the trend.

12.13 There may be some debate regarding the actual values used for rate of growth of demand for health care based on trend analysis. Detailed figures are given in Appendix 12 - Annex III A. For instance, the study calculates that GP consultations have risen by about 2% per annum over a nine year period - 1981 to 1990. However, the first year in this time-series appears to be untypical. In fact, the series would suggest something more like 2% over the whole of the previous nine years. In relation to hospital in-patient activity, it may be necessary to compare the rate of growth from the period 1981 to 1990, with other periods or rates of growth experienced in many other countries.

12.14 Medical staff productivity is defined as output per doctor, where the doctor input is in terms of WTE, and where output is the appropriate measure of health care activity (eg. inpatient case, outpatient attendance, GP consultation). There are problems with such a measure. It is impossible to define what is "pure" medical staff productivity since we cannot separate out the contribution of other staff groups (or labour vs capital). The comparison of productivity levels over time is hampered by concurrent changes in medical technology for instance, which may affect output in terms of quality or complexity. Moreover, we have reservations about the assumption of continuing strong growth in medical staff productivity defined in this way.

12.15 Different combinations of medical labour substitution were considered, (see Appendix 12 - Annex IIIB). There are no data on appropriate ratios for substituting medical staff or on the variations in the feasibility of substitution between specialties. In addition, even where relatively conservative ratios of substitution are included in the model, total NHS spend increases, implying that it costs more to replace medical input by non-medical input. If this is correct, hospitals would not wish to undertake such substitution in the long- term (although in the short-term supply problems could force such behaviour).

12.16 Non-medical costs are assumed to rise each year. The study assumed that there would be no significant real growth in the pay of public sector medical staff in the foreseeable future. It has not been possible to build in how salaries may vary under an internal market with pay freedoms.

Results

12.17 Because the various medical staffing scenarios are based on a series of assumptions, and in particular some fairly crucial ones about which we are rather dubious (eg. no increase in real pay, increases in medical workforce productivity, increasing substitution and the 3%-4% pa increase in case and bed-related unit costs), we have reservations about the reliability of the conclusions of the study so far. All these assumptions need critical scrutiny and their implications need to be tested through sensitivity analysis.

12.18 Although we wished to estimate demand for health services separately from the likely financial resource available to the NHS, the demand for health care is constrained by including the "resource" factor into the three health care scenarios. This results in the three health resourcing scenarios being paired exclusively with each of the three health spending scenarios. This may result in the conclusion that all scenarios are affordable, as indeed happened. It might have been more appropriate to consider pairing any health resource scenario with any health care demand scenario, giving nine possible combinations, a number of which are not affordable.

12.19 Table 12.1 shows the overall results from the model. Year 0 is taken as the base year. Under the three scenarios demand for doctors could rise by between

+17.10% and +38.10% over the subsequent 20 years. The study reached the conclusion that all scenarios are affordable, when the three health resourcing scenarios are paired exclusively with each of the three health spending scenarios (eg. the low growth health resource scenario is paired with the low growth health demand scenario).

12.20 More detailed results, including the variables found to be most significant or insignificant, are at Appendix 12 - Annex V.

FURTHER WORK NEEDED

12.21 The model provides the flexibility to vary the impact of the different assumptions. All the assumptions need critical scrutiny and their implications and importance tested through sensitivity analysis. We should then consider what other assumptions might be made and undertake sensitivity analysis in order to see what difference they make to the model.

12.22 The scenarios and the model require further development. Areas we consider need further work include medical staff productivity, the effects of substitution, how the growth in health care demand could best be modelled and the shift of services between sectors and specialities.

CONCLUSION

12.23 We recognise that this project was ambitious, but we think that it is most important that further research efforts continue to be directed at those issues which affect doctors. Doctors are an essential but expensive cohort of the NHS workforce and if we are to plan their numbers successfully, we clearly need the means to do the job as well as possible. We are confident that the work done so far on the affordability of doctors, has given us a sound basis on which to develop a robust planning mechanism.

12.24 The Committee would be pleased to receive comments on the methodology and assumptions used in this study. Please reply by 29th September 1995 to:

Mrs Meena Paterson (Secretariat)
Medical Workforce Standing Advisory Committee
NHS Executive
Room 2W07 Quarry House
Quarry Hill
Leeds LS2 7UE

Table 12.1 Summary of Results

	Year 0	Scenario 1		Scenario 2	Scenario 3	
			% change from base scenario	Base Scenario		% change from base scenario
Number of doctors	84,872	99,414	-6.70%	106,540	117,180	+10.00%
% change in number of doctors from year 0	-	+17.10%	-	+25.50%	+38.10%	-
Cost of doctors as a % of cost of NHS	13.35%	11.21%	+0.54%	10.67%	11.11%	+0.44%
% Private Health share of GDP	0.64%	1.27%	+0.16%	1.11%	1.27%	+0.16%
% NHS share of GDP	5.74%	5.61%	-0.24%	5.85%	5.69%	-0.12%
% health share of GDP	6.38%	6.87%	-0.09%	6.96%	6.96%	-

13 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

13.1 We have considered a wide range of issues over the two years since our first report. In attempting to foresee developments in healthcare which will affect predictions about the number of doctors the UK will need in 20 years time (and thus the number that must start training now), this report may well raise more questions than it answers.

13.2 In this report we have outlined our thoughts and conclusions on those issues which we think will be most significant; advances in medical technology, changing skill mix, the continued effects of the 1990 NHS and Community Care Act, and current policies on junior doctor's hours and postgraduate training. We are no more able to predict the future than anyone else and there are uncertainties now which may not be so uncertain in a few years time. Our advantage as a Standing Committee is that we can keep track of changes and review topics and priorities over time.

Medical School Intake

13.3 We believe that action is necessary to increase the medical school intake from the soonest practical date and that increases should be handled in the most cost effective manner. We have recommended an increase in medical school intake which will help ensure that there are sufficient new entrants to the profession, for the future supply of doctors to meet demand.

We *recommend* that the Government should plan for a gradual increase in medical students for five years, from 1996 to arrive at a maximum annual target intake of 4970 by the year 2000.

We *recommend* that higher education bodies have regard to the desirability of achieving cost effective expansion in planning for the increased target.

Research

13.4 We have previously recommended research where we considered it most necessary and have highlighted gaps in our knowledge or information. We remain eager to be kept informed on all aspects of health care relevant to medical staffing issues and will continue to seek out expert advice and opinion. We invite specific comments on one aspect of our research to date, the Affordability Study.

13.5 Our committee's own research capability is modest, but we think that certain areas mentioned throughout the report, should command priority on the research agenda of other responsible organisations, and that the results of this work should be drawn together to inform future workforce planning.

> **We *recommend* that further research is commissioned on the effects of substitution, medical staff productivity, the differential development of service provision between sectors and between specialties; and that the modelling work on the growth of health care demand and the affordability of doctors is taken forward.**

Other Recommendations

13.6 We reported to Secretary of State in March 1994 outlining suggestions for changes to medical workforce planning mechanisms in England and our recommendations are summarised here for completeness.

> **We *recommend* that the workforce planning committee structure (which advises on hospital medical staffing issues in England) be revised to reflect recent and proposed changes in the NHS.**
>
> **The revised structure should enable employers of doctors, professional organisations and educational bodies to influence the development of medical staffing policy and should ensure effective monitoring of the implementation of policies and plans.**

13.7 We believe that it is essential to optimise the skills of all health care professionals, exploring alternative forms of health care delivery where necessary.

> **We *recommend* that skill mix changes are promoted where they may benefit staff and patients; and that new initiatives should be carefully evaluated particularly with respect to patient outcomes and efficiency gains. Results and conclusions from such evaluations should be shared and discussed to enable the development of good practice guidance.**

> **We *recommend* that a central database on the development and evaluation of new roles, innovations and practices be established; and that information from this be made available for the advice and guidance of purchasers and providers wishing to alter local staffing arrangements to support cost-effective, high quality health care provision.**

LOOKING AHEAD

13.8 We will continue to monitor trends in the demand for doctors and assess the extent to which supply meets that demand. We intend to review our current projection on a regular basis and to report further when it appears appropriate to do so. We also hope to continue developing the work on the affordability of doctors in the light of comments from readers of this report. We also note the continuing need for accurate on medical workforce numbers and distribution to enable us to keep track of the situation.

13.9 One crucial issue which we have addressed only obliquely in this report, is the possible effect on doctor supply of the increasing proportion of women entering the medical workforce. Tentative assumptions about this effect have been incorporated into our model of doctors supply. To examine the issue thoroughly we need considerably more data (both qualitative and quantitive) than are presently available and we expect that information from a cohort study of doctors careers will be available to us by the middle of 1995, and this, together with recently published work will contribute to our future consideration on this issue.

Appendix 1

MEMBERSHIP

CHAIRMAN

Professor Sir Colin Campbell, Vice-Chancellor of Nottingham University;

MEMBERS

Dr John Ball, CBE former Chairman, Medical Practices Committee; and a member of the General Medical Council, a Councillor of the Royal College of General Practitioners and the BMA;

Professor David Bartholomew, Professor of Statistics, LSE; member, first and second Advisory Committees for Medical Manpower Planning;

Dr Fiona Caldicott, President of the Royal College of Psychiatrists; Consultant and Medical Director, South Birmingham

Mr Douglas Gentleman, Consultant Neurosurgeon, Dundee Royal Infirmary ; member, General Medical Council;

Mr Bryan Harrison, former Regional General Manager North East Thames Regional Health Authority (member of MMSAC from June 1993)

Professor Sir Keith Peters, FRS, Regius Professor of Physic, Cambridge University; former Chairman of MRC Physiological Systems Board;

Dame Rosemary Rue, DBE, former President of the BMA, and of the Medical Women's Federation;

Professor Dorothy Wedderburn, Senior Research Fellow, Management School, Imperial College; former Principal, Royal Holloway and Bedford New College;

Dr Robert Wilson, Principal Research Fellow in Economics,
Institute of Employment Research, Warwick University.

OBSERVERS

Dr Clifford Hall, Deputy Chief Medical Officer, Department of Health & Social Services, Northern Ireland Office (from January 1994.)

Dr Henrietta Campbell, Deputy Chief Medical Officer, Department of Health & Social Services, Northern Ireland Office (to December 1993.)

Dr David Ewing, Senior Medical Officer, Home and Health Department, Scottish Office.(from January 1994)

Dr Chris Fleming, Principal Medical Officer, Home and Health Department, Scottish Office (to December 1993)

Dr Peter Lyne Senior Medical Officer, Medical Manpower and Education, Welsh Office (from September 1994)

Dr Dewi Owen, Prinicpal Medical Officer, Medical Manpower and Education, Welsh Office. (to June 1994)

DEPARTMENT OF HEALTH

Dr Robert Hangartner, Senior Principal Medical Officer, Medical Education, Training and Staffing Division (from October 1993)

Dr Peter Bourdillon, Senior Principal Medical Officer, Medical Manpower and Education Division (to October 1993)

Mr Steve Catling, Assistant Secretary, Medical Education, Training and Staffing Division

Dr Rowan Wilson, Senior Medical Officer, Medical Education, Training and Staffing Division (from May 1993)

SECRETARIAT

Mrs Gill Bellord, Secretary, Medical Education, Training and Staffing Division

Mrs Meena Paterson, Medical Education, Training and Staffing (from May 1993)

Mr Bill Barron, Personnel Division, Statistics Branch

Mr John Bates, Personnel Division, Statistics Branch

Ms Becky Sandhu, Economics and Operational Research Division

Mrs Sue Gane, Department for Education (from June 1994)

Mr Martin Markus, Department for Education (to January 1994)

Appendix 2

BODIES SUBMITTING EVIDENCE

British Medical Association Scottish Office

British Paediatric Association

British Medical Association*

Committee of Regional Advisers in General Practice in England (CRAGPIE)

Committee of Postgraduate Medical Deans*

Conference of Royal Medical Colleges*

Faculty of Public Health Medicine*

Joint Consultants Committee*

Medical Women's Federation

National Health Service in Scotland Management Executive

National Association of Health Authorities and Trusts

NHS Trust Federation

Patients Association*

Regional General Managers*

Regional Directors of Public Health *

Regional Medical Manpower and Personnel Group

Royal College of Midwives Trust

Royal College of General Practitioners

Royal College of Radiologists

Scottish Joint Consultants Committee

Bodies marked * presented oral evidence to the Committee

INFORMAL MEETINGS AND VISITS

Dr K Calman, Chief Medical Officer, England

Dr Cormie, Dr Cremona & Dr Ferguson - Junior doctors in Scotland

Professor C George, Chairman, GMC Education Committee

Dr R Kendell, Chief Medical Officer, Scotland

Professor Laurie Geffen, Postgraduate Dean, Queensland, Australia

Dr David Gordon, Programme Director, The Wellcome Trust

Dr Martin McNichol, Chairman, Central Middlesex Trust

Mr Bob Nicholls, Executive Director, London Implementation Group

Mr Ken Jarrold, Director of Human Resources NHS Executive, formerly Regional General Manager, Wessex Regional Health Authority

Mrs Yvonne Moores, Chief Nursing Officer, England

Dr Jenny Simpson, Secretary, British Association of Medical Managers

Professor Marshall Marinker, Director of Education in Medicine, Merk, Sharpe and Dhome

Ms Isobel Allen, Policy Studies Institute

Churchill John Radcliffe Hospital, Oxford

College of Radiographers

National Association of Health Authorities and Trusts

New Cross Hospital, Wolverhampton

Northern General Hospital, Sheffield

Transplant Unit, Papworth Hospital, Cambridge

Patient Focused Care Seminar - London Business School

Royal College of Radiologists

Royal College of Nursing

Appendix 3

Current Control Mechanisms on the Main Grades of Doctors Employed by the NHS

Training Grades

GRADE / LEVEL	CONTROL MECHANISM	COMMITTEE	COVERS
Medical Student	Advisory target intake (distribution controlled and monitored by the Higher Education Funding Councils)	MMSAC	United Kingdom
Pre-registration House Officer	Advisory quotas	JCC	England & Wales
	SOHHD fix distribution in conjunction with postgraduate deans		Scotland
	University approved and monitored	NICPMDE	NI
Senior House Officer	Advisory - set ceiling and distribution by Region	TSG	England
	" "	WMDMC	Wales
	No ceiling but new SHO posts subject to central approval	ACME	Scotland
	No ceiling but trends monitored by NHSME(NI)	-	NI

Registrar	Advisory by specialty and by Region	JPAC	England
	" "	JPAC	Wales
	SOHHD fix target numbers in conjunction with ACME nationally and postgraduate deans regionally	ACME	Scotland
	Advisory by specialty	HSSC	NI
Senior Registrar	Advisory by specialty and by Region	JPAC	England
	" "	JPAC	Wales
	SOHHD fix establishment numbers in conjunction with ACME nationally and postgraduate deans regionally	ACME	Scotland
	Advisory by specialty	HSSC	NI
GP Trainee	No limits	-	England & Wales
	Limited to 10% of number of GP principals	-	Scotland
	Advisory on number of placements to be funded	GMCSC-CMAC	NI

Career Grades

Consultant	No controls - 2% + per annum increase encouraged	TSG	England
	" "	WMDMC	Wales
	No formal target for expansion and no controls	-	Scotland
	No regional controls	-	NI
General Practitioner	No ceiling - advisory on distribution	MPC	England
	" "	MPC(W)	Wales
	" "	SMPC	Scotland
	" "	RMC	NI
Associate Specialist	Personal appointment - no ceiling	-	England
	Personal assimilation	WMDMC	Wales
	Personal appointment SOHHD with advice from ACME	-	Scotland
	Advisory -in consultation with BMA(NI)	HSSC-CMAC	NI
Staff Grade	Advisory - ceiling 10% of consultant numbers	TSG	England
	" "	WMDMC	Wales
	No allocation of quotas	-	Scotland
	Advisory 10% ceiling	HSSC-CMAC	NI

Appendix 4

The Rt Hon Virginia Bottomley MP JP
Secretary of State for Health
Richmond House
79 Whitehall
London SW1A 2NS

8 March 1994

MEDICAL MANPOWER STANDING ADVISORY COMMITTEE (MMSAC)
Managing the New NHS

When I wrote to you on 21 December about your proposals to improve the management of the NHS I said that MMSAC would be considering the implications of these changes for medical workforce planning. As this is such an important and immediate issue the Committee decided that rather than wait to include our views in a report to you later this year I should write to you without delay about options for the future. We concentrate particularly on the possible changes in effective advisory machinery at local and national level in the new structure. Our comments relate solely to the position in England, as we recognise that other management
and manpower planning systems operate elsewhere in the United Kingdom.

Any new system proposed for medical workforce planning in **England** must, we believe, meet three main criteria:

> it must reflect your medical staffing policy goal 'to plan and provide for an adequate supply of appropriately trained doctors' while recognizing certain fundamental principles, such as appropriate delegation to operational levels; coherence and cohesion; value for money; and equity and equality of opportunity;
>
> it should enable the legitimate interests of key players to be taken into account without undermining the fundamental structure of accountability and responsibility within the NHS and Government.
>
> and although confined to England it must take into account relevant activities and interests across the UK and, where possible and appropriate, the EU.

Focusing on the hospital and community health services, current arrangements in **England** are based on an arithmetical approach to planning, with a plethora of different committees and advisory bodies at national and regional levels. We believe that the present system needs to be changed to accommodate a number of different factors, most of which have come to prominence in the last few years

> changes in the NHS with the introduction of purchasers and providers. This has led to a much larger number of employing authorities for career doctors. Their future

plans and needs for medical staff are influenced by a variety of factors and are more flexible than hitherto;

changes proposed in NHS management involving the removal of the Regional tier and its replacement by a smaller number of Regional offices as part of the NHS-ME;

changes in medical education and training, in particular the changes proposed in specialist medical training in the CMO's Specialist Training Report now accepted by Government;

acknowledgement of the need to move to shorter working hours for junior doctors, resulting in successful achievement of the 83 contracted hours target and the identification of changes needed in existing manpower controls to deliver the 72 contracted and 56 worked hours targets.

We consider that a system needs to be designed which will promote:

more effective co-ordination and coherence between the different groups at national level, including the need to bring educational and medical staffing policies closer together (both Calman and the Harveian Oration made clear the close inter-dependence between the two) and at local level, with the Regional Task Forces seen as critical;

more effective delegation from the centre to respond to the increased freedom of local managers and the need to respond more effectively to local pressures and priorities;

more flexibility in the methodology and approach to planning, particularly in the face of increased volatility in service planning and information deficiencies, together with an increased emphasis in national monitoring to match the increased delegation of decisions.

effective exchange of information both from the centre to purchasers and providers and back to the centre from the service. Genuine feedback of data and information (though not at a burdensome level) would inform both local planning and national forecasting.

As part of this system a single, cohesive advisory body is needed in England both to enable the profession and educational bodies to influence the development of medical staffing policy and to assist effective monitoring of the implementation of policies and plans.

At national level the required functions would include:

monitoring the work of Task Forces and Deans in achieving the New Deal Targets;

monitoring changes in the numbers of doctors training outside Higher Specialist Training (HST);

planning, on a more flexible basis than hitherto, the number of HST posts and opportunities in each specialty;

monitoring the numbers of doctors in career grades and the development of appropriate quality standards to ensure the right balance is maintained between consultants and other fully-trained staff; and

monitoring the standards of training for both home and overseas graduates.

At local level the required functions would include:

supporting, advising and monitoring the Postgraduate Dean and Task Force in the implementation of both Calman and the New Deal;

authorizing the release of staff grade posts and changes in the number and distribution of SHO posts.

We have considered a number of options for how the necessary functions might be provided if the present advisory machinery were to be changed. We commend to you a radical approach which might involve:

continuing MMSAC with broadly unchanged remit and membership; and

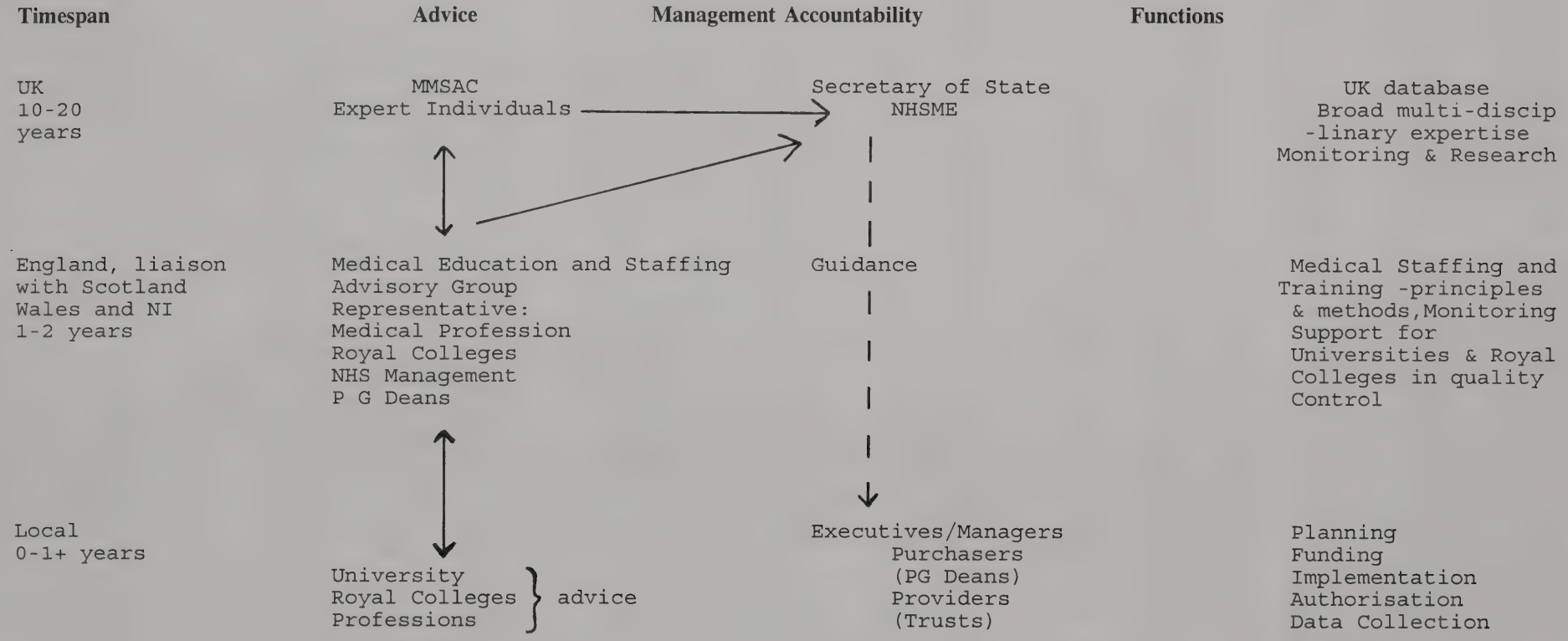
creating a single, small but representative, medical education, training and staffing advisory steering group to advise the ME about medical staffing and training issues. It would consider issues discussed and worked up in a range of either functional or interest group focused sub-groups. Its approach and agenda would be strategic and essentially monitoring. Operational work (such as planning of HST, implementation of New Deal etc) would be reserved for **executive** bodies i.e. NHS-ME, Postgraduate Deans and NHS service management. The new group would advise on the overall methodology to be adopted and would monitor its effective implementation and outcome.

We felt that the disadvantages of such an approach would be relatively few, especially if there were interest-group based sub-groups chaired by the specific representative on the main Steering Committee but with a common secretariat. Such an approach would enable a range of specific problems to be aired, discussed and clarified without the need for all to come forward to the main Steering Group.

I have copied this letter to Ken Jarrold for his consideration as Chairman of the Functions Analysis Group on Human Resources. I would be interested in your view as to the suitability of this approach.

Professor Sir Colin Campbell

PROPOSED FRAMEWORK FOR MEDICAL WORKFORCE PLANNING



THE WORKFORCE PLANNING MODEL AND SUPPLY MODEL DATA

5A The Workforce Planning Model

5B Central Projection

5C Variant A - Lower Wastage

5D Variant B - Overseas decreases

5E Variant C - Number of EC doctors increases fivefold

5F Variant D - Medical School Intake variant

5G Variant E - Medical School Intake variant

THE WORKFORCE PLANNING MODEL AND PREPARATION OF THE DATA

THE WORKFORCE PLANNING MODEL

For the 1992 report, "Planning The Medical Workforce", MMSAC used the career simulation model (CSM) to forecast the future supply of doctors. This model used various probabilities to assess where, in the medical career structure, successive cohorts of doctors would be placed over a twenty year period. The CSM was developed and adopted after a study to investigate the replacement for the long term manpower planning model used by previous committees. This study also concluded that an approach to modelling which used System Dynamics software should be adopted. A model has been developed using System Dynamics and has been used this year.

The structure of the new model, the Workforce Planning Model (WPM), is similar to that of the CSM. The few structural differences are described below:

i) Both the CSM and the WPM have an "out of service pool" to model the distribution of available doctors outside current NHS employment. Both models allow doctors to rejoin the medical career structure, but in the CSM model, they can join only at the grade at which they left. In the WPM, they can join at a higher grade (i.e "invisible promotion" can occur). This mirrors reality, where promotion through the grades can be earned while working overseas.

ii) The WPM has greater flexibility for changes in career structure (for example, Calman or CHS regrades to the hospital sector)

The advantages of the WPM over the CSM include:

- Increased projection periods can be specified
- The nature of the model is concise, so it can be checked and modified easily
- The implications of the Calman initiative can be modelled
- Increased flexibility in the specification of flow rates
- More detailed output.

PREPARATION OF THE DATA USED IN THE WPM

Since MMSAC's first report, neither the Medical Manpower Record (MMR) nor the Parkhouse studies have been updated. Hence, for this modelling work, much of the data constructed for use in the CSM is used. However, to reflect the structural changes in the new model and the receipt of 1993 stocks data, various flow rates have been altered and the new baseline uprated to reflect 1993 GB medical workforce Census figures. The baseline stock and forecast flow rates previously constructed for modelling purposes used the Medical

Manpower Record (MMR) as their main source. These data were then placed in a version of the CSM which simulates the career path of one cohort of medical school intake; the *Steady State Model*. This version of the model is so called because the time since qualification (TSQ) and grade mix produced is equivalent to that produced if a constant inflow to the career structure had occurred over a fifty year period. The data input to this model were then modified to ensure:

i) consistency with the findings of the Parkhouse cohort studies.

ii) a sensible overall grade balance in the steady state; and

iii) consistency between the grade balance produced by the steady state and that in the baseline stocks for each TSQ.

This re-alignment work tempered the potential effects of certain discrepancies within the MMR.

The adoption of the new model means that it is now easier to produce more detailed output. As well as showing the number and grade mix for each projection, we can assess trends in gross wastage, net wastage and promotion flows across each of the grades. This will be particularly important when considering Calman variants.

Central Projection. **Appendix 5B**

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,021**	**3,465**	**100,897**
2000										
UK Male	1,880	6,739			6,780	17,815	1,114	20,548	492	55,368
UK Female	1,880	6,539			4,646	5,032	1,854	10,140	2,119	32,210
EC Doctors	335	1,245			451	145	50	222	26	2,474
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,254**	**19,317**	**0**	**0**	**15,827**	**26,006**	**5,193**	**36,770**	**3,501**	**110,868**
2005										
UK Male	1,880	6,812			6,476	18,702	1,145	20,888	544	56,447
UK Female	1,880	6,679			5,245	6,684	2,259	11,799	2,330	36,876
EC Doctors	384	1,429			517	166	58	254	30	2,838
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,303**	**19,713**	**0**	**0**	**16,189**	**28,567**	**5,636**	**38,802**	**3,768**	**116,978**
2010										
UK Male	1,880	6,823			6,444	19,065	1,154	21,005	579	56,951
UK Female	1,880	6,693			5,450	8,450	2,652	13,315	2,579	41,019
EC Doctors	433	1,612			583	187	65	287	34	3,201
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,352**	**19,921**	**0**	**0**	**16,429**	**30,717**	**6,045**	**40,467**	**4,056**	**121,988**
2020										
UK Male	1,880	6,824			6,452	18,533	1,088	19,689	590	55,056
UK Female	1,880	6,702			5,531	11,236	3,231	15,101	2,987	46,668
EC Doctors	532	1,978			716	230	80	352	42	3,930
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,451**	**20,297**	**0**	**0**	**16,650**	**33,013**	**6,573**	**41,003**	**4,483**	**126,470**

[Note : Any difference in totals arises from rounding errors]

Variant A - Lower Wastage.

Appendix 5C

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,021**	**3,465**	**100,897**
2000										
UK Male	1,880	6,815			7,156	18,610	1,254	21,209	542	57,467
UK Female	1,880	6,677			4,903	5,281	2,009	10,542	2,276	33,567
EC Doctors	335	1,245			451	145	50	222	26	2,474
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,254**	**19,531**	**0**	**0**	**16,460**	**27,050**	**5,488**	**37,832**	**3,708**	**114,324**
2005										
UK Male	1,880	6,885			6,836	19,968	1,321	21,752	613	59,255
UK Female	1,880	6,813			5,557	7,169	2,476	12,416	2,524	38,835
EC Doctors	384	1,429			517	166	58	254	30	2,838
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,303**	**19,920**	**0**	**0**	**16,861**	**30,318**	**6,029**	**40,282**	**4,031**	**121,744**
2010										
UK Male	1,880	6,896			6,791	20,739	1,349	22,052	663	60,370
UK Female	1,880	6,824			5,776	9,206	2,922	14,134	2,799	43,541
EC Doctors	433	1,612			583	187	65	287	34	3,201
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,352**	**20,125**	**0**	**0**	**17,101**	**33,148**	**6,511**	**42,333**	**4,360**	**127,930**
2020										
UK Male	1,880	6,895			6,796	20,742	1,288	21,067	690	59,357
UK Female	1,880	6,832			5,956	12,539	3,588	16,315	3,248	50,259
EC Doctors	532	1,978			716	230	80	352	42	3,930
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,451**	**20,499**	**0**	**0**	**17,319**	**36,525**	**7,130**	**43,594**	**4,844**	**134,362**

[Note : Any difference in totals arises from rounding errors]

Variant B - Falling number of overseas doctors. **Appendix 5D**

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,021**	**3,465**	**100,897**
2000										
UK Male	1,880	6,739			6,780	17,815	1,114	20,548	492	55,368
UK Female	1,880	6,539			4,646	5,032	1,854	10,140	2,119	32,210
EC Doctors	335	1,245			451	145	50	222	26	2,474
Overseas	134	4,042			3,332	2,543	1,833	4,942	729	17,555
Total	**4,229**	**18,566**	**0**	**0**	**15,208**	**25,534**	**4,852**	**35,851**	**3,366**	**107,607**
2005										
UK Male	1,880	6,812			6,476	18,702	1,145	20,888	544	56,447
UK Female	1,880	6,679			5,245	6,684	2,259	11,799	2,330	36,876
EC Doctors	384	1,429			517	166	58	254	30	2,838
Overseas	115	3,469			2,860	2,182	1,573	4,241	625	15,066
Total	**4,259**	**18,389**	**0**	**0**	**15,098**	**27,734**	**5,035**	**37,183**	**3,530**	**111,228**
2010										
UK Male	1,880	6,823			6,444	19,065	1,154	21,005	579	56,951
UK Female	1,880	6,693			5,450	8,450	2,652	13,315	2,579	41,019
EC Doctors	433	1,612			583	187	65	287	34	3,202
Overseas	94	2,823			2,327	1,776	1,281	3,452	509	12,261
Total	**4,287**	**17,951**	**0**	**0**	**14,805**	**29,478**	**5,152**	**38,059**	**3,701**	**113,433**
2020										
UK Male	1,880	6,824			6,452	18,533	1,088	19,689	590	55,056
UK Female	1,880	6,702			5,531	11,236	3,231	15,101	2,987	46,668
EC Doctors	532	1,978			716	230	80	352	42	3,930
Overseas	51	1,532			1,262	963	695	1,872	276	6,652
Total	**4,343**	**17,036**	**0**	**0**	**13,962**	**30,962**	**5,094**	**37,015**	**3,895**	**112,306**

[Note : Any difference in totals arises from rounding errors]

Variant C - No. of EC doctors increases fivefold. **Appendix 5E**

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,021**	**3,465**	**100,897**
2000										
UK Male	1,880	6,739			6,780	17,815	1,114	20,548	492	55,368
UK Female	1,880	6,539			4,646	5,032	1,854	10,140	2,119	32,210
EC Doctors	542	2,015			729	234	81	359	43	4,003
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,461**	**20,086**	**0**	**0**	**16,106**	**26,096**	**5,224**	**36,906**	**3,517**	**112,397**
2005										
UK Male	1,880	6,812			6,476	18,702	1,145	20,888	544	56,447
UK Female	1,880	6,679			5,245	6,684	2,259	11,799	2,330	36,876
EC Doctors	739	2,747			994	319	111	489	58	5,458
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,658**	**21,031**	**0**	**0**	**16,667**	**28,720**	**5,689**	**39,036**	**3,796**	**119,598**
2010										
UK Male	1,880	6,823			6,444	19,065	1,154	21,005	579	56,951
UK Female	1,880	6,693			5,540	8,450	2,652	13,315	2,579	41,019
EC Doctors	936	3,480			1,259	405	141	619	74	6,914
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,855**	**21,789**	**0**	**0**	**17,105**	**30,934**	**6,121**	**40,800**	**4,096**	**126,653**
2020										
UK Male	1,880	6,824			6,452	18,533	1,088	19,689	590	55,056
UK Female	1,880	6,702			5,531	11,236	3,231	15,101	2,987	46,668
EC Doctors	1,330	4,945			1,790	575	200	880	105	9,825
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**5,249**	**23,264**	**0**	**0**	**17,724**	**33,358**	**6,693**	**41,531**	**4,546**	**132,365**

[Note : Any difference in totals arises from rounding errors]

Variant D - Medical School Intake Variant. **Appendix 5F**

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,021**	**3,465**	**100,897**
2000										
UK Male	1,880	6,739			6,780	17,815	1,114	20,548	492	55,368
UK Female	1,880	6,539			4,646	5,032	1,854	10,140	2,119	32,210
EC Doctors	335	1,245			451	145	50	222	26	2,474
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,254**	**19,317**	**0**	**0**	**15,827**	**26,006**	**5,193**	**36,770**	**3,501**	**110,868**
2005										
UK Male	2,095	7,170			6,507	18,702	1,147	20,892	545	57,058
UK Female	2,095	7,034			5,271	6,684	2,260	11,803	2,332	37,477
EC Doctors	384	1,429			517	166	58	254	30	2,838
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,733**	**20,425**	**0**	**0**	**16,246**	**28,567**	**5,638**	**38,809**	**3,771**	**118,189**
2010										
UK Male	2,095	7,561			6,811	19,101	1,169	21,080	590	58,507
UK Female	2,095	7,426			5,759	8,461	2,677	13,476	2,609	42,504
EC Doctors	433	1,612			583	187	65	287	34	3,202
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,782**	**21,392**	**0**	**0**	**17,104**	**30,765**	**6,085**	**40,802**	**4,097**	**125,028**
2020										
UK Male	2,095	7,594			7,166	19,121	1,142	20,515	627	58,260
UK Female	2,095	7,465			6,135	11,635	3,382	15,869	3,125	49,705
EC Doctors	532	1,978			716	230	80	352	42	3,930
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,881**	**21,830**	**0**	**0**	**17,968**	**34,001**	**6,778**	**42,596**	**4,657**	**132,711**

[Note : Any difference in totals arises from rounding errors]

Variant E - Medical school intake variant. Appendix 5G

	Training Grades					Non-Training Grades				TOTAL
	PRHO	SHO	Reg	SReg	SpR	Cons	Other	GMS	CHS	
1993										
UK Males	1,690	6,960	3,819	3,508		15,514	1,073	19,815	418	52,797
UK Female	1,690	5,342	1,761	1,614		3,138	1,442	8,170	2,162	25,319
EC Doctors	266	989	291	67		115	40	176	21	1,965
Overseas	159	4,793	3,224	727		3,015	2,174	5,860	864	20,816
Total	**3,805**	**18,084**	**9,095**	**5,916**	**0**	**21,782**	**4,729**	**34,022**	**3,465**	**100,898**
2000										
UK Male	1,880	6,739			6,780	17,815	1,114	20,548	492	55,368
UK Female	1,880	6,539			4,646	5,032	1,854	10,140	2,119	32,210
EC Doctors	335	1,245			451	145	50	222	26	2,474
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,254**	**19,317**	**0**	**0**	**15,827**	**26,006**	**5,193**	**36,770**	**3,501**	**110,868**
2005										
UK Male	2,095	7,170			6,507	18,702	1,147	20,892	545	57,058
UK Female	2,095	7,034			5,271	6,684	2,260	11,803	2,332	37,477
EC Doctors	384	1,429			517	166	58	254	30	2,838
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**4,733**	**20,425**	**0**	**0**	**16,246**	**28,567**	**5,638**	**38,809**	**3,771**	**118,189**
2010										
UK Male	2,310	7,920			6,842	19,101	1,170	21,183	591	59,117
UK Female	2,310	7,781			5,785	8,461	2,678	13,479	2,610	43,104
EC Doctors	433	1,612			583	187	65	287	34	3,202
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**5,212**	**22,105**	**0**	**0**	**17,161**	**30,765**	**6,088**	**40,809**	**4,100**	**126,239**
2020										
UK Male	2,654	9,416			8,191	19,413	1,194	21,188	663	62,719
UK Female	2,654	9,272			7,009	11,794	3,491	16,495	3,238	53,952
EC Doctors	532	1,978			716	230	80	352	42	3,930
Overseas	159	4,793			3,951	3,015	2,174	5,860	864	20,816
Total	**5,999**	**25,459**	**0**	**0**	**19,867**	**34,451**	**6,939**	**43,894**	**4,807**	**141,417**

[Note : Any difference in totals arises from rounding errors]

Appendix 6

EXTRACT FROM COUNCIL OF EUROPE COMMITTEE OF MINISTERS

RECOMMENDATION No R(93)3

Member states should establish appropriate means to determine the situation concerning the balance between demand and supply, for instance through a minimum personnel database.

Member states should endeavour to:

- promote career counselling centres and better inform young people, particularly through the media, about health care professional career prospects, to redress imbalance of under/over supply;

- take measures to reassess the value of general practice and to develop health promotion;

- improve the quality of medical training by providing special training, for example in social medicine and health promotion;

- promote the growth of other professions such as physiotherapy and occupational therapy to ensure an appropriate balance of skills, best use of resources and an efficient workforce profile;

- ensure that the nursing profession retains a high quality image through an appropriate general level of education and professional education; that nurses are not used to perform inappropriate skill tasks;

- provide opportunities for nurses, midwives and professions supplementary to medicine to take higher education and degree courses, and to undertake research in preparation for roles of clinical excellence, leadership and management;

- provide adequate numbers of appropriately trained support staff to assist qualified health care professionals, when necessary and appropriate;

- promote multiprofessional education:

- to take better into account public health concerns and favour a global approach of patients;

- to ensure greater mobility between the professions and make reorientation possible;

- to foster amongst health professionals an appreciation of each other's work and goals and a better recognition of their professional identify.

Appendix 7

REGISTRATION OF PRACTITIONERS FROM MEMBER STATES OF THE EUROPEAN ECONOMIC AREA

COUNTRY OF QUALIFICATION

	1986	1987	1988	1989	1990	1991	1992	1993	1994*
Austria									10
Belgium	32	48	48	41	33	47	43	49	43
Denmark	15	7	11	15	11	10	16	19	13
Finland									10
France	18	17	26	27	33	22	24	28	25
Germany	55	200	414	277	131	177	189	254	309
Greece	100	115	152	162	167	156	179	201	138
Iceland									10
Ireland	59	289	311	253	226	202	197	167	117
Italy	71	86	74	69	87	78	101	120	102
Luxembourg	0	0	0	0	0	0	0	0	0
Netherlands	35	146	161	202	168	115	92	113	98
Norway									5
Portugal	16	16	14	13	15	14	20	15	11
Spain	44	71	98	125	149	135	192	191	110
Sweden									34
Total	445	995	1309	1184	1020	956	1053	1157	1035

Source: GMC * Year to date August 1994 - As from January 1994 the rights of freedom of movement have been extended to the following 5 EFTA countries who ratified the Economic Area Agreement (EAA) Austria, Finland, Iceland, Norway and Sweden.

EC DOCTORS WORKING IN THE HOSPITAL SECTOR
GREAT BRITAIN AT 30 SEPTEMBER EACH YEAR

NUMBER	QUALIFIED IN EC COUNTRY OTHER THAN UK					
	1988	1989	1990	1991	1992	1993
TOTAL	1341	1655	1645	1751	1881	2007
CONSULTANT	234	240	245	254	273	280
ASSOCIATE SPECIALIST	24	20	24	18	18	19
STAFF GRADE (1)		1	5	9	11	18
SENIOR REGISTRAR	68	72	76	89	92	120
REGISTRAR	156	176	206	261	284	301
SENIOR HOUSE OFFICER	644	813	757	750	767	845
HOUSE OFFICER	57	163	172	201	277	286
HOSPITAL PRACTITIONER	14	13	13	11	10	9
CLINICAL ASSISTANT	142	157	147	158	149	129
OTHER	2	-	-	-	-	-

PERCENTAGE OF TOTAL IN EACH GRADE	QUALIFIED IN EC COUNTRY OTHER THAN UK					
	1988	1989	1990	1991	1992	1993
TOTAL	100%	100%	100%	100%	100%	100%
CONSULTANT	17	15	15	15	15	14
ASSOCIATE SPECIALIST	2	1	1	1	1	1
STAFF GRADE (1)		0	0	1	1	1
SENIOR REGISTRAR	5	4	5	5	5	6
REGISTRAR	12	11	13	15	15	15
SENIOR HOUSE OFFICER	48	49	46	43	41	42
HOUSE OFFICER	4	10	10	11	15	14
HOSPITAL PRACTITIONER	1	1	1	1	1	0
CLINICAL ASSISTANT	11	9	9	9	8	6
OTHER	0	-	-	-	-	-

(1) New Grade from 1989

OVERSEAS DOCTORS WORKING IN THE HOSPITAL SECTOR
GREAT BRITAIN AT 30 SEPTEMBER EACH YEAR

NUMBER	QUALIFIED OUTSIDE EC					
	1988	1989	1990	1991	1992	1993
TOTAL	10,261	10,904	11,682	12,247	12,767	13,328
CONSULTANT	2,171	2,283	2,391	2,453	2,564	2,590
ASSOCIATE SPECIALIST	457	499	577	606	656	720
STAFF GRADE (1)		24	180	340	575	860
SENIOR REGISTRAR	360	396	468	475	524	585
REGISTRAR	2,629	2,633	2,681	2,657	2,666	2,670
SENIOR HOUSE OFFICER	2,230	2,570	2,921	3,224	3,518	3,751
HOUSE OFFICER	86	125	113	165	147	134
HOSPITAL PRACTITIONER	141	143	152	143	133	146
CLINICAL ASSISTANT	2,171	2,223	2,193	2,173	1,978	1,868
OTHER	16	8	6	11	6	4

PERCENTAGE OF TOTAL IN EACH GRADE	QUALIFIED OUTSIDE EC					
	1988	1989	1990	1991	1992	1993
TOTAL	100%	100%	100%	100%	100%	100%
CONSULTANT	21	21	20	20	20	19
ASSOCIATE SPECIALIST	4	5	5	5	5	5
STAFF GRADE (1)		0	2	3	5	6
SENIOR REGISTRAR	4	4	4	4	4	4
REGISTRAR	26	24	23	22	21	20
SENIOR HOUSE OFFICER	22	24	25	26	28	28
HOUSE OFFICER	1	1	1	1	1	1
HOSPITAL PRACTITIONER	1	1	1	1	1	1
CLINICAL ASSISTANT	21	20	19	18	16	14
OTHER	0	0	0	0	0	0

(1) New Grade from 1989

Appendix 10

SKILL MIX EXAMPLES

Limited extension - development of additional skills for a few specified procedures eg. siting intravenous lines, blood samples, steroid injections:

- neonatal nurses (Exeter)
- night nurse practitioner (Guys)
- orthopaedic outpatient physiotherapists (Southmead)

Limited expansion - which includes large parts of junior doctor's work but excludes independent assessment, investigation, diagnosis, treatment and prescription

- Surgical Practice Manager (nurse doing part of house surgeons job) (Cheltenham)
- Physiotherapist Clinical Assistant in neurosurgery (Frenchay)
- Advanced Cardiac Recovery Nurse Practitioner (part of junior anaesthetic and surgical jobs) (Oxford)
- Surgical Nurse Practitioner (part of HS job) (Taunton)

Major role expansion which only excludes prescribing:

- Nurse Practitioners in A&E (SE Thames)
- Advanced Neonatal nurse Practitioner (Wessex)

Creation of a new occupational group - with differing training backgrounds. Examples include:

- Cardiac Surgeons Assistant (Oxford)
- Transplant Clinicians Assistants (Papworth)
- Clinical Support Worker (Sheffield)

CONSULTANT WORKLOAD SURVEY

1. The sample included 6 medical directors of whom 2 were also clinical directors, and 22 clinical directors. Nine were clinical tutors. The average number of formal roles (additional to consultant eg. directorships, regional educational advisors, college tutor) was 1.74 (range 0-4).

2. Three posts (4.2%) were part time, 23 (32.4%) were maximum part time and the rest were full time. The mean number of fixed clinical sessions was 9.75 (6.6 for clinical directors and 6.0 for medical director).

3. Sixteen (22.5%) respondents were female and mean age was 46 years.

4. The amount of on call varied greatly between specialties. Over 60% of consultants are on a 1:4 or more often; 68% are frequently/usually in the hospital after 6pm when not on call, 4.5% in frequently after 8pm when not on call rising to 24% when on call. 30% are frequently or occassionally in the hospital after midnight on call and 60% are frequently in at the weekend on call often for long periods. More than 50% are in the hospital for some time at the weekends when not on call.

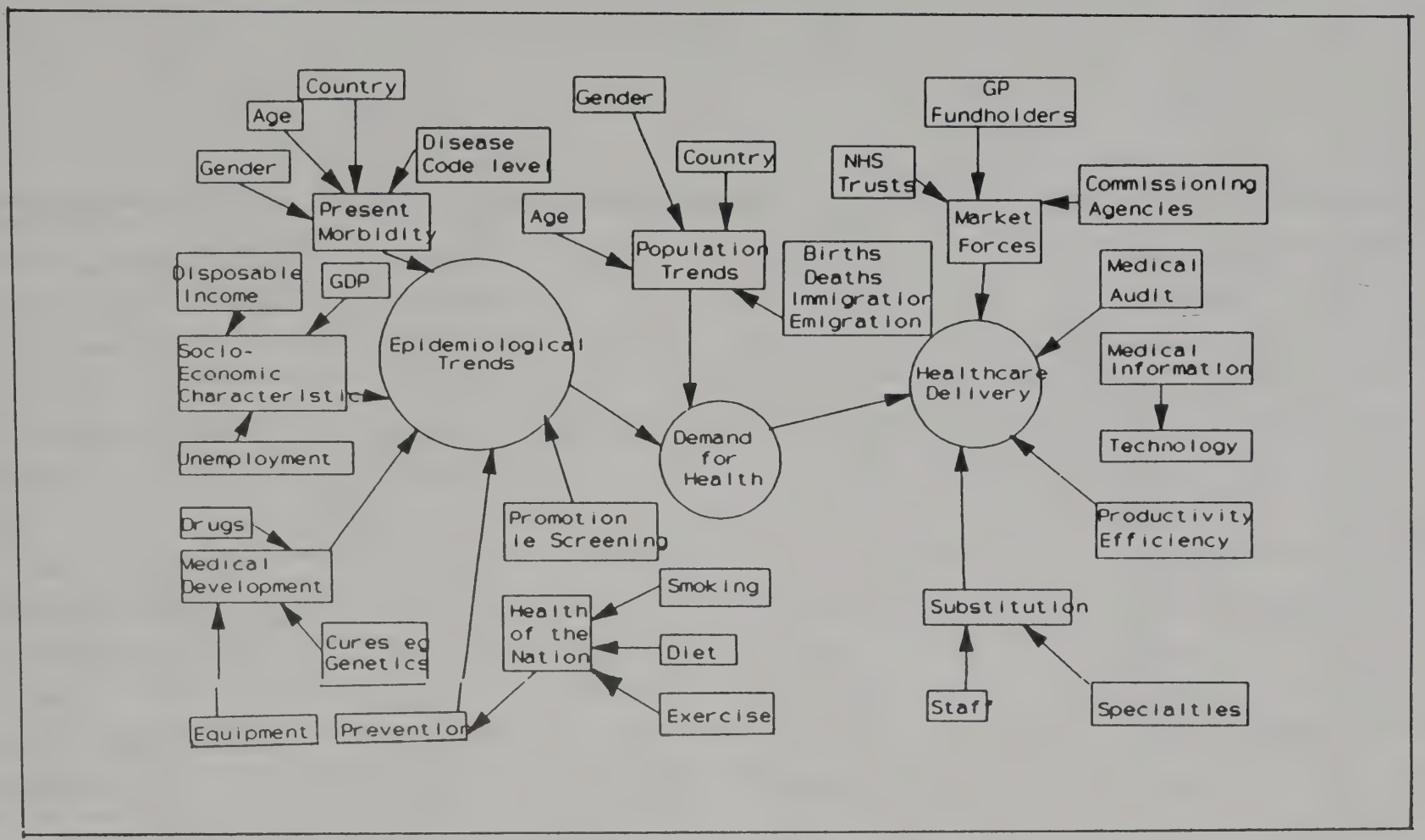
5. Of those to whom it applied; 39% were NOT prepared to do second on-call, 32% do it anyway and 29% were prepared to do it occasionly.

6. Respondents were also asked about the productivity of their units. The average number of patients treated had increased by 17% over 5 years. The number of respondents who knew their unit's annual budget was too small and inaccurate to be useable. Interestingly only 58% of clinical directors (who have budgetry control) knew what their approximate budget for the current year was and only 45.8% knew the figures for the previous year.

7. **Specialty of participants N=71**

Anaesthetics	5
Cardiology	1
Dermatology	1
Endocrinology	1
ENT	2
Gastroenterology	1

Geriatrics	3
General surgery	4
Genito-urinary Medicine	1
Haematology	1
Intensive Care	1
Microbiology	1
Neonatology	1
Neurology	1
Obstetrics and Gynaecology	1
Oral and Maxillofacial Surgery	3
Orthopaedics and Trauma	4
Opthalmology	2
Paediatrics	11
Palliative Care	2
Pathology	3
Plastic surgery	3
Psychiatry	6
Radiology	3
Radiotherapy and Oncology	2
Renal medicine	1
Respiratory Medicine	3
Rheumatology	2
Urology	1


Country
Age
Gender
Disease Code level
Present Morbidity
Disposable Income
GDP
Socio-Economic Characteristics
Unemployment
Drugs
Medical Development
Cures eg Genetics
Equipment
Prevention
Epidemiological Trends
Promotion ie Screening
Health of the Nation
Smoking
Diet
Exercise
Gender
Country
Age
Population Trends
Births
Deaths
Immigration
Emigration
Demand for Health
GP Fundholders
NHS Trusts
Commissioning Agencies
Market Forces
Medical Audit
Medical Information
Technology
Healthcare Delivery
Productivity Efficiency
Substitution
Staff
Specialties

Annex II: 3 scenarios - health services and workforce	Scenario 1	Scenario 2	Scenario 3
Economic growth	Slower than trend	On trend	Faster than trend
Social security spend	Increases	Plateaus	Decreases
Rationalisation of health care services	Slower than currently	As currently	Faster than currently
Hospital closures	Increase	As currently	Decrease
Population expectation of the NHS	Fall	Increase	Increase
Proportion of care in private sector	Current trend	Current trend	Above current trend
Absolute amount of private healthcare	Falls	Increases	Increases
Morbidity	Increases	Current level	Falls
Unemployment	Increases	Current level	Falls
Use of internal market management	Increases	Current trend	Declines
Use of protocols	Increases	Increases	As currently
Creation of super-specialties	Decline in trend	As current trend	Marked increase
Use of minimally and non-invasive surgery	Current trends	Current trends	Current trends
Proportion of care in primary care sector	Increases	Current trends	Current trends
Rate of research and development	Slows down	Current level of funding	Increases

A) Health Care Assumptions

a. This section describes the main assumptions the Study applies to health care.

The sources of the assumptions are indicated by:
LS:literature search
QR:questionnaire response
FG:: focus group
IO:informed opinion.

Table 1

Assumption (source of assumption)	Scenario 1 - movement from current trend	Scenario 2 - current trend	Scenario 3 - movement from current trend
Capital investment (IO)	Below trend	+3.4%	Above trend
Expenditure on drugs (QR, IO)	Below trend	+4%	Above trend
Morbidity (data)	Worse than trend	Reduction	Better than trend
Achievement of Health of the Nation (data)	Not achieved	Generally achieved	More than achieved
New screening programmes (QR)	Below trend	Slight increase	Above trend
Spend on private healthcare (Laing & Buisson)	Below trend	+10.5%	Above trend
Population expectation of healthcare (IO)	Down	Increasing	Above trend
Hospital rationalisation programme (QR)	Below trend	Increasing	Below trend
Hospital closures (QR)	Above trend	Increasing	Below trend
Social security spend (IO)	Up	Plateauing	Down
Use of protocols (QR, IO)	Above trend	Increasing	On trend
Use of day surgery (QR)	No change	Increasing	On trend
Use of minimally & non-invasive surgery (QR)	No change	Increasing	On trend
Managing the market (IO)	Above trend	Increasing	Below trend
Development of high technology (LS, QR)	Below trend	Increasing	Above trend
Development of sub-specialties (LS, QR)	Below trend	Increasing	Above trend
NHS activity (data)	On trend or below	Increasing	Above trend
Proportion in private sector (Laing & Buisson)	No change	Slight increase	Increase
Private sector activity (Laing & Buisson)	Down	Plateauing	Up
Proportion spent on primary care (LS, QR)	Above trend	Increasing	On trend

The values used for the major assumptions are given below:

i. **Underlying trend** - The underlying trend in demand is based on growth in healthcare activity in the UK over the last ten years, and was calculated separately for in-patient episodes, out-patient attendances and GP consultations. The per annum growth trends for the last ten years were found to be:

in-patients and day cases +2.53%
out-patient attendances +0.31%
GP consultations +2.03%

ii. Growth in private sector activity has been assumed as shown in table 13.1

Table 2 Growth in Private Sector activity

	Years 0-5	Years 6-20
Scenario 1	4%	2%
Scenario 2	6%	2%
Scenario 3	6%	3%

iii. **Length of stay** - The Study makes the following assumptions about length of stay:

specialties which are predicted as shifting towards day cases (surgery, obstetrics & gynaecology and radiotherapy) will not see a reduced length of stay in the future;

paediatrics and accident & emergency lengths of stay will not get any shorter; and

medical and psychiatry in-patients will have a reduced length of stay in line with the current ten year trend of reduction in length of stay for all specialties (-4.75% annually).

iv. **Morbidity** - Age specific morbidity will not change regardless of the shift of population to the more elderly.

Annex III: Assumptions

B) Manpower Assumptions

The Study made assumptions covering nine areas of change in manpower use for all twelve specialty groupings. For the purposes of this chapter, the following table gives an idea of the pressures on manpower they foresaw under each scenario. "Up" and "down" refer to whether the pressures will cause manpower numbers to rise or fall. "Low", "medium" and "high" give an indication of the amount of pressure that factor will bring to bear on manpower numbers.

The sources of the assumptions are indicated in brackets.

Table 3

Area of change	Scenario 1	Scenario 2	Scenario 3
Medical development (QR, IO, LS)	**Up** Medium	**Up** High	**Up** High
Information technology (QR, LS)	**Down** Low	**Down** Low	**Down** Low
Substitution 1 (QR)	**Up** Low	**Down** Low	**Up** Low
Substitution 2 (QR, IO, LS)	**Down** Medium	**Down** Medium	**Down** Medium
Substitution 3 (IO, LS)	**Up** Medium	**Up** High	**Up** High
Substitution 4 (IO, QR, LS)	**Down** High	**Down** High	**Down** Low
Substitution 5 (QR)	**Up** Medium	**Up** Medium	**Up** Medium
Clinical audit and continuing professional development (IO, QR)	**Up** High	**Up** High	**Up** High
Productivity (IO, QR, data)	**Down** High	**Down** Medium	**Down** Low
Overall effect	**Down** Low	**Up** High	**Up** Very high

The definitions of the areas of change are:

Medical development: changes in medical practice and the care of patients, including new techniques, drugs and gene therapy.

Information technology: addresses the impact that developing information technology will have on clinicians.

Substitution 1: substitution between consultants in different specialties.

Substitution 2: substitution between career grade doctors, i.e. consultants and GP principals. This mainly covers the shift from secondary to primary care.

Substitution 3: substitution between different grades of doctors. This covers the effects of the "New Deal".

Substitution 4: substitution between clinicians and other health professionals (professions allied to medicines and nurses).

Substitution 5: movement of career grade doctors into non-clinical activities, e.g. management, clinical directors.

Clinical audit and continuing professional development: covers the consequences of implementing the Calman report, and requirements for continuing professional development.

Productivity: covers increased production efficiency of doctors. Productivity improvements of 2% per annum apply to all the workforce in the model, apart from clinicians. The Study modelled the effects of a range of productivity improvements by doctors: 1.75% per annum for Scenario 1, 1.5% per annum for Scenario 2 and 0.75% per annum for Scenario 3.
Although medical manpower productivity has shown little, if any, improvement in the last 40 years, this was prior to the introduction of the internal market, and the study has assumed there will be increasing pressure on providers to achieve productivity gains.

Thus, all three scenarios show future medical development increasing the demand for doctors. Information technology will have a very small effect on the number of doctors required, and clinical audit and continuing professional development will increase the number of clinicians required significantly under all three scenarios. The effects of the other assumptions vary under the different scenarios.

For Scenario 1, the main assumptions made are that there will be a considerable amount of substitution for doctors by other healthcare professionals, and that doctors' productivity will increase considerably. Scenario 2, the baseline scenario, envisages that more doctors will be necessary to cope with medical developments and technological change, and also that the implementation of the "New Deal" will require a lot more clinicians. Scenario 3 shows that the effects of the "New Deal" will be considerable.

Annex III Assumptions

C) Assumptions on GDP, health care budget and costs

GDP Assumptions

A. GDP growth has been based on the trend growth in the UK economy since the Second World War. Three growth cases were assumed:

a base case, with just under 2 per cent underlying growth;

a faster growth case, with 2.25 per cent underlying growth; and

a slower growth case, with 1.75 per cent underlying growth.

Forecast of health care budget

B. The health budget in twenty years' time was forecast in a two stage process involving estimating GDP growth, then estimating the share of GDP devoted to health (both publicly and privately provided).

C. **Forecasting GDP growth** - GDP growth was forecast by extrapolating the trend of the growth performance of the UK since the Second World War. In the earlier years of the forecast, growth has been assumed to be faster than trend, as the UK moves out of recession. To allow for uncertainty in forecasting, three cases were constructed.

D. **Share of GDP devoted to health** - The share of GDP taken by the NHS has grown over time, rising from less than 4% in 1950 to nearly 6% in 1990. This is also true of the share of GDP taken by health in other industrialised nations. The Study therefore produced a health share of GDP forecast which relied upon the size of the nation's GDP. The results ranged from 6.49% in the slower growth case to 6.84% in the higher growth case. A similar process was used to estimate the resources that will be available to the private healthcare sector in the future.

Cost assumptions

E. Cost calculations have been based on average costs. The Study felt that at the level of increases in activity predicted, of 50% or more over 20 years, it is unlikely that an increase could be delivered at marginal cost, i.e. without incurring any more fixed costs. However, all cost increases do allow for efficiency gains, which should cover any economies of scale - when a larger scale operation allows cheaper costs.

F. Bed related costs are assumed to rise at 3.4% per annum, and case related costs at 4% over and above general inflation.

G. Although medical staff salaries have had a tendency to rise over time, regardless of pay inflation, in the Study it was assumed that there would be no significant real growth in public sector medical staff pay in the foreseeable future.

Annex IV Data

A. The Study is based on morbidity data and on population figures. The other area of data used in the model is healthcare costs.

B. **Morbidity** - For the purposes of the study, morbidity was assumed to be expressed demand, that is the number of people presenting with a particular disease, rather than incidence, that is the number of people who actually have the disease. A number of ICD9 (International Classifications of Disease Version 9) conditions were selected to represent activity. Those chosen covered 50-60% of the workload, and were those which generate significant activity, or those where change through medical technology or prevention is expected to lead to increased or decreased manpower requirements. Total ICD9 activity by specialty group was also collected.

C. The activity was classified into one of: medical specialties; paediatrics; accident & emergency; surgical specialties; obstetrics & gynaecology; anaesthetics; radiotherapy; radiology; pathology; psychiatry; primary care/general practice; and public health medicine.

D. The baseline was split into hospital in-patient and day cases; hospital out-patient; primary care activity and day care activity; and by age, gender and by country.

E. **Population** - The prime data source for population figures was the 1991-based national population projections provided by OPCS.

F. **Costs** - Present healthcare costs were used as a baseline. These included medical manpower salary costs, case related and bed related hospital costs, costs of the GMS and private healthcare costs. The source of the data was the CIPFA returns for 1992-3. These give costs split by individual specialties, and by function, e.g. wards, outpatients, day care, or theatres.

ANNEX V RESULTS

A. Table 1 below shows the increase in doctor numbers needed under each of the 3 scenarios - expressed in index numbers. Year 0 is taken as the base year.

Table 1 Index of Increase in Doctor Numbers Under Each Scenario

	Year 0	Year 5	Year 10	Year 20
Scenario 1	100.0	101.8	115.6	120.9
Scenario 2	100.0	123.4	126.3	134.5
Scenario 3	100.0	127.2	134.3	151.8

B. All the scenarios in the Study for medical manpower were affordable. The Study also highlighted a number of other important findings.

Ageing population

C. The projected demographic changes over the next 20 years are relatively modest and will not have a material impact on the manpower model of the number of doctors required in 5, 10 or 20 years time. Thus the effect of an ageing population was not significant.

Productivity

D. Productivity of doctors is a major driver of demand for doctors. The Study assumed that clinicians will become more productive over time, but if this was not achieved it would drive up demand for doctors. For example, should no productivity improvements be achieved within Scenario 2 by year 20 the manpower requirement would be increased by 46%. A further effect of the productivity assumptions is that, although currently 13.35% of NHS spending is taken up by medical staffing, by Year 20 this proportion is expected to be only 10.6%.

Substitution

E. The reduction in junior doctors' hours is a further major driver of demand for doctors. Sensitivity analysis demonstrates that if the reduction in junior doctors' hours is not managed by way of substitution, then demand for doctors rises substantially and would clearly undermine "Achieving a Balance".[1]

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[1] The major objectives of *Achieving a Balance* are to improve patient care by increasing the amount of care provided by fully trained hospital doctors and to improve morale amongst junior doctors by safeguarding their career opportunities.

Costs

F. There are four main cost variables in the model which influence total NHS costs. These are shown in table 2, with the direction in which the factor pushes costs.

Table 2 Cost factors

Cost factor	Direction of pressure
Real increases in cost	Up
Cost-efficiency savings	Down
Percentage of in-patients as day cases	Down
Reduction in in-patient length of stay	Down

G. Real increases in costs are the increases in costs year on year within the NHS over and above economy-wide inflation. Generally health input costs rise faster than retail price inflation. The real increase in bed-related and case related costs (of 3.4% and 4% respectively) is the main driver for pushing up all costs. All the other variables have the effect of restraining expenditure. Cost efficiency savings and reductions in inpatient length of stay are more important for reducing costs than the anticipated shift from inpatient to day case treatment.

DEFINITIONS

EUROPEAN COMMUNITY

For simplicity and convenience, this report refers throughout to the EC. Since 1 January 1994 the EC provisions on training and mutual recognition for doctors (Medical Directive 93/16/EEC) have also applied in certain EFTA countries (Austria, Norway, Sweden, Finland and Iceland) which, together with the EC Member States and Liechtenstein, constitute the European Economic Area ("EEA"). The provisions will also be extended to Liechtenstein when the EEA Agreement comes into force in relation to that country. Since 1 January 1995, Austria, Sweden and Finland have become members of the EC.

MEDICAL STAFF PRODUCTIVITY

Medical staff productivity is defined as output per doctor.
The doctor input is in terms of whole time equivalent and output is the appropriate measure of health care activity (eg inpatient case, outpatient attendance, GP consultation).

EXPENDITURE FIGURES

Expenditure figures have been given in either:

- real terms: figures adjusted for the effect of general inflation as measured by the GDP market price deflator;

- volume terms: increases in health cash spending adjusted for changes in health specific pay and price input costs. These are usually in terms of HCHS rather than the NHS due to the unavailability of up to date data on the later.

SKILL-MIX

The balance between trained and untrained, qualified and unqualified, and supervisory and operative staff within a service area as well as between different staff groups.

WASTAGE

The term wastage is used throughout this report to refer to those qualified doctors who have left the main public sector (MPS), which consists of Hospital and Community Health Service, General Medical and Ophthalmic Practitioners and medically qualified staff in Universities. Doctors who leave the MPS to work solely in private practice or outside the UK are included in measures of wastage.

GLOSSARY

A&E	-	ACCIDENT AND EMERGENCY
ANHD	-	ADDITIONAL NOTIONAL HALF DAY
ACME	-	ADVISORY COMMITTEE ON MEDICAL ESTABLISHMENTS
ACMMP	-	ADVISORY COMMITTEE FOR MEDICAL MANPOWER PLANNING
AI	-	ARTIFICIAL INTELLIGENCE
AIDS	-	ACQUIRED IMMUNE DEFICIENCY SYNDROME
AS	-	ASSOCIATE SPECIALIST
BAMM	-	BRITISH ASSOCIATION OF MEDICAL MANAGERS
BDA	-	BRITISH DENTAL ASSOCIATION
BMA	-	BRITISH MEDICAL ASSOCIATION
CHS	-	COMMUNITY HEALTH SERVICE
CIPFA	-	CHARTERED INSTITUTION OF PUBLIC FINANCE ASSOCIATION
CMAC	-	CENTRAL MEDICAL ADVISORY COMMITTEE
CME	-	CONTINUING MEDICAL EDUCATION
CMO	-	CHIEF MEDICAL OFFICER
CRDC	-	CENTRAL RESEARCH AND DEVELOPMENT
CSM	-	CAREER SIMULATION MODEL
CSST	-	CERTIFICATE OF COMPLETION OF SPECIALIST TRAINING
DDRB	-	DOCTORS AND DENTIST REMUNERATION BOARD
DENI	-	DEPARTMENT OF EDUCATION NORTHERN IRELAND
DH	-	DEPARTMENT OF HEALTH
DHA	-	DISTRICT HEALTH AUTHORITY
DHSS	-	DEPARTMENT OF HEALTH AND SOCIAL SECURITY
DFE	-	DEPARTMENT FOR EDUCATION
DMUs	-	DIRECTLY MANAGED UNIT
DPHs	-	DIRECTORS OF PUBLIC HEALTH
EC	-	EUROPEAN COMMUNITY
EU	-	EUROPEAN UNION
ENT	-	EAR, NOSE & THROAT
FHS(A)	-	FAMILY HEALTH SERVICES (AUTHORITY)
GB	-	GREAT BRITAIN
GDP	-	GROSS DOMESTIC PRODUCT
GMC	-	GENERAL MEDICAL COUNCIL
GMCSC	-	GENERAL MEDICAL CARE SUB-COMMITTEE (OF CMAC)
GMS	-	GENERAL MEDICAL SERVICES

GMSC	-	GENERAL MEDICAL SERVICES COMMITTEE (of the BMA)
GP	-	GENERAL PRACTITIONER
HA	-	HEALTH AUTHORITIES
HCHS	-	HOSPITAL AND COMMUNITY HEALTH SERVICES
HEFCE	-	HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND
HEFCW	-	HIGHER EDUCATION FUNDING COUNCIL FOR WALES
HSSC	-	HOSPITAL SERVICES SUB-COMMITTEE
HST	-	HIGHER SPECIALIST TRAINING
IANI	-	INTENDED AVERAGE NET INCOME
ICD9	-	INTERNATIONAL CLASSIFICATIONS OF DISEASE VERSION 9
IM&T	-	INFORMATION MANAGEMENT AND TECHNOLOGY
JCC	-	JOINT CONSULTANTS COMMITTEE
JPAC	-	JOINT PLANNING ADVISORY COMMITTEE
MAT	-	MINIMAL ACCESS THERAPY
MG	-	MINISTERIAL GROUP
MMR	-	MEDICAL MANPOWER RECORD
MMSAC	-	MEDICAL MANPOWER STANDING ADVISORY COMMITTEE
MPC	-	MEDICAL PRACTITIONERS COMMITTEE
MPS	-	MAIN PUBLIC SECTOR
MTM	-	MEDIUM TERM MODEL
MWSAC	-	MEDICAL WORKFORCE STANDING ADVISORY COMMITTEE
NAHAT	-	NATIONAL ASSOCIATION OF HEALTH AUTHORITIES AND TRUSTS
NI	-	NORTHERN IRELAND
NICPMDE	-	NORTHERN IRELAND COUNCIL FOR POSTGRADUATES MEDICAL AND DENTAL EDUCATION
NHS	-	NATIONAL HEALTH SERVICE
NP	-	NURSE PRACTITIONER
ODTS	-	OVERSEAS DOCTORS TRAINING SCHEME
OPCS	-	OFFICE OF POPULATION CENSUSES AND SURVEYS
OTC	-	OVER THE COUNTER
PA	-	PHYSICIAN ASSISTANT
PFC	-	PATIENT FOCUSED (OR CENTERED) CARE
PCFC	-	POLYTECHNIC AND COLLEGES FUNDING COUNCIL
PLAB	-	PROFESSIONAL AND LINGUISTIC ASSESSMENT BOARD
PHM	-	PUBLIC HEALTH MEDICINE
PRHOs	-	PRE-REGISTRATION HOUSE OFFICERS
PWG	-	PERMANENT WORKING GROUP

R&D	-	RESEARCH AND DEVELOPMENT
RCGP	-	ROYAL COLLEGE OF GENERAL PRACTITIONERS
RMC	-	REGIONAL MANPOWER COMMITTEE (MEDICAL)
RHA	-	REGIONAL HEALTH AUTHORITY
SGUMDER	-	STEERING GROUP FOR UNDERGRADUATE MEDICAL EDUCATION AND RESEARCH
SHEFC	-	SCOTTISH HIGHER EDUCATION FUNDING COUNCIL
SCOPME	-	STANDING COMMITTEE ON POSTGRADUATE MEDICAL EDUCATION
SHO	-	SENIOR HOUSE OFFICER
SIFTR	-	SERVICE INCREMENT FOR TEACHING AND RESEARCH
SMPC	-	SCOTTISH MEDICAL PRACTITIONER COMMITTEE
SOHHD	-	SCOTTISH OFFICE HOME AND HEALTH DEPARTMENT
SR	-	SENIOR REGISTRAR
TSG	-	THE TECHNICAL SUB-GROUP
UCCA	-	UNIVERSITIES' CENTRAL COUNCIL ON ADMISSIONS
UFC	-	UNIVERSITIES' FUNDING COUNCIL
UK	-	UNITED KINGDOM
UKCC	-	UNITED KINGDOM CENTRAL COUNCIL
USA	-	UNITED STATES OF AMERICA
WHO	-	WORLD HEALTH ORGANISATION
WIST	-	WOMEN IN SURGICAL TRAINING
WMDMC	-	WELSH MEDICAL AND DENTAL MANPOWER COMMITTEE
WPM	-	WORKFORCE PLANNING MODEL
WTE	-	WHOLE TIME EQUIVALENT

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